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Simulation-Based Mounted Brigade Training Program: History and Lessons Learned

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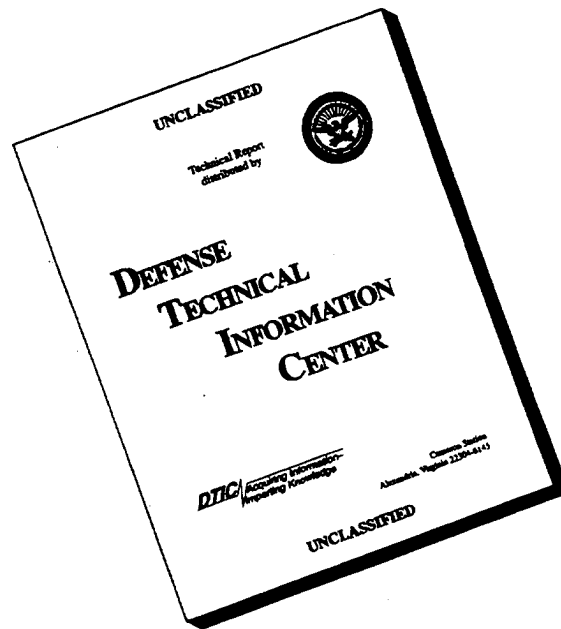
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FOREWORD

Reserve Component units have an increasingly important role in the force mix. These units continually face the challenge of training within time and resource limitations. To help meet this challenge, Congress provided Fiscal Year 1993 research and development funding for the establishment of a Reserve Component Virtual Training Program (RCVTP) at Fort Knox, Kentucky. The intent of this program is to provide structured, compressed training focused initially on Army National Guard (ARNG) armor units, making innovative use of available simulation technologies. In November 1994, the program was redesignated the Virtual Training Program (VTP) due to its increasing use for Active Component training.

A contract entitled "Simulation-Based Multiechelon Training Program for Armor Units (SIMUTA)" was the initial training research and development effort for the RCVTP. This effort provided training support packages for armor, mechanized infantry, and scout platoons; armor companies and company teams; cavalry troops; armor battalions and battalion task forces on the Simulation Networking (SIMNET) simulation; and battalion staffs in Janus and the Commander/Staff Trainer. The Simulation-Based Mounted Brigade Training (SIMBART) program expands training to the brigade staff.

This report documents experiences and lessons learned from the development and formative evaluation of the SIMBART program. This training program has been provided to the VTP observer/controller team at Fort Knox, the 116th Cavalry Regiment of the Idaho ARNG, and the 48th Separate Armored Brigade in the Georgia ARNG as part of the Simulation in Training for Advanced Readiness (SIMITAR) program. Trainers and training developers will find this report useful for guiding the continuing development, implementation, and expansion of structured simulation-based training programs.

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This report summarizes the efforts of the Simulation-Based Mounted Brigade Training (SIMBART) team. Throughout the project, the administrative support staff and simulation experts admirably supported the authors, who were the entire team at the end of the project. The administrative support staff devoted intense efforts to produce the five-volume set of approximately 30 linear inches of training support materials. The support staff had to produce these five-volume sets on three separate occasions with the last set being prepared in five copies. Danelle L. Wozniak was the support team leader, with Beth Welch, Shelly Warren, and Kathy Smallwood assisting her. Lori L. Bailey led the team of graphic artists assisted by Diane Catanzaro. The graphic artists supplied untold numbers of illustrations, maps, and graphics for the training support packages (TSPs). During the project, two team members departed to work for other companies. Jack L. Turecek led the team during the initial stage of the design phase and laid out the ground rules for the team. Jeffrey K. Skilling, the SIMBART team's Janus expert, guided the team on the Janus simulation and performed countless other tasks to make the project as successful as it was. The following offsite personnel provided expert assistance in these specialty areas: Frank LaNasa (intelligence), George Hethcoat (division message traffic), and Brad Gill (fire support).

The Fort Knox Janus site support staff, MSG Malaquais Montoya (Fort Knox Site Manager for Janus and the Brigade/Battalion Battle Simulation) and SFC Charles O. Hagar (Advanced Research Projects Agency Janus Systems Administrator assisted by SSG Joseph E. Wells), provided outstanding support and assistance throughout the project. The Virtual Training Program (VTP) observer/controller (O/C) team provided feedback on all aspects of the TSPs and assisted during the pilots and trials of the exercises. LTC Joe Hughes with his executive officer, LTC Pete Rose, initially led the VTP O/C team. Subsequently, LTC Joe Purser and his executive officer, MAJ John Collins, led the VTP O/C team. Without the VTP O/C team's assistance, the resulting TSPs would have been far less user friendly. Finally, COL Jerry L. Veach, Army National Guard Special Assistant to the Commanding General, Fort Knox, coordinated for training unit support, represented the user community, and served as the exercise director during the September 1995 exercise trial.

SIMULATION-BASED MOUNTED BRIGADE TRAINING PROGRAM: HISTORY AND LESSONS LEARNED

EXECUTIVE SUMMARY

Research Requirement:

The Simulation-Based Mounted Brigade Training objectives were:

1. To design and develop a comprehensive experimental simulation-based program to train Army National Guard mounted brigade staffs using the Advanced Research Projects Agency Janus. The training program was to build on the existing Virtual Training Program (VTP) exercises and to focus on the execution phase of the missions.
2. To conduct a formative evaluation of the brigade training program during its initial implementation.
3. To refine the training program based on the results of the formative evaluation and to identify methods and lessons learned during the development of this training program.

Procedure:

Three conceptual objectives were established for the SIMBART program. First, each mission was to produce staff behavior cues that trigger specific brigade staff actions. Second, observers were to focus on collective behaviors of staff sections and command posts. Third, each mission was to be designed and structured with a high likelihood of successful mission accomplishment.

The program objectives were accomplished in three phases. During the first phase, the SIMBART team designed exercises and identified tasks to be trained for each exercise. Additionally, the team outlined requirements for the observer/controller (O/C) team and specified how the O/C team would conduct the exercises. The second phase of the project was the development phase. During this phase, the SIMBART team built exercises on the simulation, conducted tests of the exercises on the simulation, and produced all of the materials necessary to support exercise execution. These materials included complete orders packages for the unit and guidelines to the O/Cs for conducting exercises, controlling exercises, observing performance, conducting the after action reviews (AARs), and producing take-home packages. The final phase was the documentation phase, during which the SIMBART team recorded the history of the program and lessons learned from the current effort.

Findings:

The SIMBART program includes three brigade-level exercises (movement to contact, area defense, and deliberate attack). These exercises have the potential of providing an outstanding training experience for a mounted brigade staff. The key component for effective training of the brigade staff is the O/C team. The O/C team determines the effectiveness of the training by controlling the simulation, interacting with the unit during exercise execution, and conducting the AARs.

The SIMBART team used a different presentation format for the SIMBART training support packages (TSPs). This format was a significant improvement over the format used for TSPs in previous VTP development efforts. The TSPs provide complete instructions for all O/C functions. This allows an O/C team to quickly learn its roles and functions, and to conduct a brigade staff exercise.

The SIMBART program provides an innovative approach for the conduct of AARs. This approach focuses on how the staff supports the commander in making key decisions. This approach also makes the commander an integral part of the training program.

Utilization of Findings:

The purpose of this report is to provide a history of the SIMBART program and the lessons learned from the current effort. The history highlights major occurrences and significant developments of the program and includes both successful and less successful endeavors. The authors have attempted to be candid about what happened during the program. The intent of this report is to highlight the situations that the SIMBART team encountered that may aid similar efforts.

SIMULATION-BASED MOUNTED BRIGADE TRAINING PROGRAM: HISTORY AND LESSONS LEARNED

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SIMULATION-BASED MOUNTED BRIGADE TRAINING (SIMBART) PROGRAM: HISTORY AND LESSONS LEARNED

Introduction

The Simulation-Based Mounted Brigade Training (SIMBART) program was a research and development effort that applied methods (Campbell, Campbell, Sanders, Flynn, & Myers, 1995) and lessons learned (Hoffman, Graves, Koger, Flynn, & Sever, 1995) from the Reserve Component Virtual Training Program (RCVTP) to the training of mounted brigade staffs. The SIMBART training program provides the training management component and operational plan to the unit, enabling unit personnel to concentrate their time and effort on the execution phase of training. The original SIMBART Statement of Work (SOW) (Army Research Institute (ARI), 1994) called for the program to make the best use of simulation capabilities available at Fort Knox and at Army National Guard (ARNG) sites for training brigade-level operations. The systems specified were Simulation Networking (SIMNET) and Advanced Research Projects Agency (ARPA) Janus. The exercises on these two simulation systems were to be mutually supporting with the SIMNET exercises training a brigade slice at the Fort Knox SIMNET facility and the ARPA Janus exercises training a brigade staff using any ARPA Janus system. The SIMBART team was to design the exercises so that an observer/controller (O/C) team could conduct the exercises at ARNG sites throughout the country. Both programs were to contain training for the O/C team. However, the Janus package had to be exportable and not dependent on a dedicated O/C team. This required the Janus package to include more in-depth O/C training on preparation for and implementation of the program.

Background

The RCVTP was established at Fort Knox, Kentucky in 1993, to develop, formatively evaluate, and implement innovative structured training for the total armor force so that networked simulation technologies were fully exploited. The RCVTP was redesignated the Virtual Training Program (VTP) in November 1994¹. The term VTP more accurately reflects a total armor force program, although it still focuses on training ARNG armor units. Before the SIMBART project, complete scenarios and training support packages (TSPs) were developed to support multiechelon training in SIMNET of armor, mechanized infantry, and scout platoons; armor companies and company teams; cavalry troops; armor battalions and battalion task forces (TFs). Additionally, TSPs were developed for battalion staffs in the Janus simulation and staff group training using the Commander/Staff Trainer (C/ST). The Janus staff training ran on a modified Janus system developed by ARPA. All SIMNET and Janus scenarios were developed within the framework of two cornerstone National Training Center (NTC) missions -- one offense and one defense. Efforts are ongoing under a separate contract to add another mission -- deliberate attack (DAK) -- to the battalion-level and below library of exercises.

¹Efforts post-dating November 1994 are described in this report as falling under the VTP while efforts pre-dating the redesignation are aligned with the RCVTP.

The intent of the VTP is to provide compressed, turn-key training to units in a simulation environment. A dedicated military O/C team provides all required training support materials to units before their participation in the training program. This includes multimedia program orientation and planning materials with complete operation orders (OPORDs). This approach enables participating units at Fort Knox to maximize their use of simulation by concentrating on the execution phase of training. O/Cs help train units by monitoring execution of exercises and providing training feedback during after action reviews (AARs). They also prepare take home packages (THPs) and provide these THPs to the unit soon after training is completed. Although the training program is highly structured, units have the flexibility of selecting from a set, or library, of over 100 exercises to meet their training needs. The unit can schedule the training for either weekend drills or two-week annual training (AT) periods. A key benefit of the VTP is its flexibility and adaptability to the unit's training needs. Because of this flexibility the O/C team and training units are executing one-week annual training cycles allowing the unit to execute both gunnery and maneuver tasks in the same year.

Congress supported the establishment of the RCVTP by providing research and development funds. The development of the initial library of training exercises was completed via a contract effort through the U. S. Army Research Institute for the Behavioral and Social Sciences (ARI) Armored Forces Research Unit at Fort Knox, Kentucky. This contract effort was entitled "Simulation-Based Multiechelon Training Program for Armor Units (SIMUTA)." The effort required not only the development and refinement of an innovative prototype training program, but also the development of methods for program growth and exportability.

Trials of the RCVTP exercises developed under the SIMUTA effort were completed in 1994. Results of the formative evaluations were highly encouraging (Hoffman, et al., 1995). Observations suggested that the tactical performance of units did improve during the training. The methodology (Campbell, et al., 1995) and the history of the program and lessons learned (Hoffman, et al., 1995) are documented in two ARI publications. ARI published another report by members of their Armored Forces Research Unit at Fort Knox (Shlechter, Bessemer, Nesselrode, & Anthony, 1995) that contains additional program findings.

Technical Objectives

The original SIMBART SOW (ARI, 1994) identified three technical objectives for the program. These objectives were:

1. "To design and develop a comprehensive experimental simulation-based program for providing collective training to ARNG mounted brigades and staffs, building upon the RCVTP. This includes development of mutually supporting ARPA Janus brigade staff exercises and SIMNET brigade slice exercises, with each focusing on maneuver execution" (p. 2).
2. "To conduct a formative evaluation of the brigade training program during its initial implementation, in accordance with approved evaluation criteria based on

training standards. This includes provision of required assistance to unit leaders and O/Cs in initial program implementation" (p. 2).

3. "To refine the brigade training program based on the results of formative evaluation, including resolution of implementation problems; and, to identify methods and lessons learned for developing training program extensions. This includes further refinement of extension methods developed under the SIMUTA effort" (p. 3).

Conceptual Objectives

Three conceptual objectives were established for the SIMBART program. First, each mission was to produce the staff behavior cues that trigger specific brigade staff actions. Second, observers were to focus on collective behaviors of the staff sections and command posts (CPs) since this leans more to the area of battle staff effectiveness as discussed by Brown (1992) and Olmstead (1992) than to staff task proficiency. Third, each mission was to have a high likelihood of mission accomplishment.

Brown (1992) states that the purpose of a structured training exercise is to create the proper cues. To achieve this purpose, the SIMBART team had to ensure that the brigade staff received proper cues. Since the brigade staff does not interact with the simulation, the SIMBART team had to ensure that the O/C team provided the cues to the staff.

For the Janus brigade staff exercise, the SIMBART team proposed that observers concentrate on how the staff performed its functions at several levels. The basic level was a staff section's effectiveness within a CP. The next level was the CP's effectiveness. The last level was the entire brigade staff's (all three CPs) effectiveness in supporting the brigade commander's decision making. This last level best represents the SIMBART team's focus on battle staff effectiveness. That is, since the brigade commander determines how a brigade staff functions, how he wants his staff to function must be a key factor in the training.

The SIMBART team wanted a high likelihood of mission accomplishment as a conceptual objective. Olmstead (1992) pointed out that other research (Mills, 1967; Gill, 1977) found that nothing contributed more to greater cohesiveness than a successful action. Since the purpose of the brigade staff training was to improve staff performance, a strategy for fostering cohesiveness was to design the training exercises to ensure mission success. This allowed the unit to enter the AAR as a cohesive group ready to discuss how staff effectiveness could be improved. Olmstead (1992) pointed out that failure could be disruptive in that it can result in "loss of confidence, bickering, recriminations, and deterioration of cohesion" (p. IV-19). Olmstead (1992) pointed out that failure could cause team members "to lose confidence in their leaders, the unit, or in themselves" (p. IV-20). In the realm of simulation, confidence in the simulation itself is an additional consideration. One of the first places participants may lose confidence is in the simulation, especially if they believe that the simulation does not replicate reality. The unit perceives that failure is not a result of its performance but is instead the result of poor replication of some critical factor within the simulation. In the SIMBART brigade staff exercise, the order is another candidate for blame. The unit perceives that any mission failure is a result of the "poor" order the unit was

"forced" to execute. The SIMBART team wanted to avoid this type of disruption in the AAR process. Thus, the SIMBART team saw ensuring a high likelihood of mission accomplishment as helping to set the stage for a positive AAR focused on improving performance.

Project History

SIMBART I

The SIMBART team began designing the missions in October 1994. As directed by the SOW (ARI, 1994), the SIMBART team looked at the SIMUTA brigade mission as a starting point for the SIMBART exercises. The SIMBART team found that while SIMUTA exercises presented plausible and challenging battalion exercises, neither of the two brigade missions was challenging nor plausible as a brigade exercise. Thus, permission was obtained to develop brigade exercises that differed from the SIMUTA exercises for Janus and SIMNET. The SIMBART team designed the exercises on terrain available within each simulation that offered the most plausible and challenging exercise for a brigade. These exercises were presented to the Contracting Officer's Representative (COR) and representatives from the VTP O/C team for review in early November. After approval, the SIMBART team continued the design and development process on these exercise concepts. The SIMBART team developed the three missions on the Janus simulation and ran several internal exercises to ensure that the exercises worked on the simulation. Partial mission outlines for these exercises are located in Appendix B.

In late January, government representatives decided that it was very important that all of the scenarios use the SIMUTA battalion orders and the terrain of the NTC central corridor as a starting point. This concept would allow for the development of a vertically integrated set of exercises from platoon to echelons above corps. The overriding importance of this decision had not been explained to the SIMBART team nor to the COR. The exercises that the SIMBART team had been developing did not meet this requirement. The SIMBART team was thus directed to embed the SIMUTA missions within the SIMBART missions. This caused the SIMBART team to stop development of the training exercises and begin designing exercises that embedded the SIMUTA battalion exercises.

During the design phase of the program, the SIMBART team had determined that it would be extremely difficult for the SIMNET simulation to support the brigade-level exercises. Because of this finding and the time lost in developing the non-embedded exercises, the COR had the contract modified so that the SIMBART team would only develop training exercises for the Janus simulation. The SIMBART team would still develop three scenario missions -- movement to contact (MTC), area defense (ADEF), and DAK. With the contract modification, SIMBART I ended and SIMBART II began.

Quality Assurance Exercise Structure

The SIMBART team developed guidelines for four levels of what they called quality assurance exercises (QAXs). The SIMBART team delineated the QAX definitions and

objectives first in an internal memorandum on February 2, 1995 and later in a memorandum revised on March 6, 1995.

The team defined these levels as follows:

1. Level 1 QAX. Conducted by the exercise author to test the feasibility of the exercise scenario, derive required technical support data, evaluate components of the tactical plan, and tailor the evaluation strategy to the exercise's structure.
2. Level 2 QAX. Conducted by internal assets from the SIMBART team under the control of the exercise author to test the vertical integration of the tactical plan, to test the Janus system's ability to support the exercise requirements, and verify the preliminary evaluation structure as well as to assist in the construction of the AAR.
3. Level 3 QAX. Conducted with external assets to fully man all components of the exercise control and evaluation structure. The test seeks to verify the tactical plan with external players, to test the training program system, and verify the evaluation data capture and feedback system.
4. Level 4 QAX. Conducted with a full complement of external observers, controllers, and interactors as well as a unit commander and staff acting in all player positions. The objective is to validate the full exercise design and structure as well as test the Janus system's operation in local or distributed mode.

The SIMBART team developed tentative windows for each exercise's QAX. This plan estimated the conduct of internal (Level 1 and 2) QAXs for all March, April, and May exercises. The SIMBART team needed external support including the VTP O/C team's help in the Level 3 QAXs during June and July. The trial using an actual ARNG brigade would be conducted sometime during August. According to this plan and the revised contract, initial training packages would be delivered to the COR on May 30. The final training packages would be revised based on the Level 3 QAXs and the August trials with the ARNG brigade (Level 4 QAX).

The COR and SIMBART team revised this plan in early March. This revision further defined the objectives for each QAX level and provided exact dates for each exercise's QAXs. The SIMBART team coordinated Level 1 and 2 QAX dates with the Janus site. Level 3 QAXs required coordination with the VTP O/C team and the Janus site. A tentative planning window for the Level 4 QAX using the ADEF was coordinated for the Idaho site for the weekend of July 21-23. The COR and SIMBART team revised these plans and windows for the Level 3 and 4 QAXs as explained later in the Pilots and Trials section of this report.

Scenario Development

For SIMBART II, ARI directed the SIMBART team to work with the Force XXI Training Program (FXXITP) Combined Arms Operations at Brigade Level, Realistically Achieved through Simulation (COBRAS) team to develop a feasible operational concept from Theater down to the previously published and emerging SIMUTA battalion operations. The

FXXITP COBRAS team was another team contracted by ARI to develop a conceptual training program for key brigade personnel. In addition to execution, the FXXITP COBRAS team was focused on the plan, prepare, consolidate, and reorganize phases of the Deliberate Decision Making Process (DDMP). Additionally, the FXXITP COBRAS team used the Army Janus and Brigade/Battalion Battle Simulation (BBS) to develop the training concept for the active Army forces. Both SIMBART and FXXITP COBRAS teams were to use the operational concept for their projects. ARI tasked the teams to develop this concept so that potential projects at the division level or higher could avoid the problem faced in the SIMBART project in not having a feasible brigade mission from which to build.

Congruence

The teams presented the corps and division concepts for all three missions (MTC, ADEF, and DAK) for approval to a doctrinal expert representing the Combined Arms Center (CAC) at Fort Leavenworth on February 1, 1995. The agreed upon definition of "approval" was that the storyline and scenario concepts were plausible and represented an acceptable solution (although not necessarily the best solution). The brief descriptions in Appendix C reflect the product of this meeting and the preceding week of review. The changes and recommendations from this review process included the large Striking Force and the high risk division concept. The products for the corps and division provided for very challenging exercises that could be developed into challenging training exercises in the future.

During the remainder of February 1995, members of the SIMBART and FXXITP COBRAS teams developed the corps and division orders. In March 1995, the FXXITP COBRAS team requested and was granted permission by ARI to take responsibility for the continued development of the corps and division operational concepts as the FXXITP COBRAS training program required more fully developed schemes for combat support (CS) and combat service support (CSS) than did the SIMBART program. ARI established rules of coordination for the effort now led by the FXXITP COBRAS team. In the end this proved not to be fully effective. Because of the more extended FXXITP training audience in CS and CSS, the FXXITP COBRAS team had to include some elements that were not included in the SIMBART exercises. Because of these added elements, the concepts developed by the FXXITP COBRAS team did not fully meet the SIMBART SOW (ARI, 1994) requirements for tactical missions.

Mission Development

Each of the three subject matter experts (SMEs) on the SIMBART team were assigned to lead the TSP development for one of the three brigade missions. Additionally, each SME was assigned at least one battalion TF in each exercise. Each SME was to develop the battalion order, necessary graphics, and the controller and interactor instructions for his assigned unit(s).

Early in the development process, the SIMBART team tested the design of the exercise on the simulation and verified brigade synchronization issues. During the Level 1 QAXs, the SIMBART team operated the ARPA Janus workstations. For these exercises,

most of the units were on automatic pilot because the SIMBART team could not man the workstations with the number of controllers called for in the exercise design.

For the Level 2 QAXs, the SIMBART team verified the courses of action it had developed by having people who were not as familiar with the exercises serve as controllers and interactors. During the Level 2 QAXs, the SIMBART team also staffed workstations to resemble the exercise design more closely. During the Level 2 QAXs, the SIMBART team examined controller and interactor cell workload and workstation assignments for the various functions in the exercise. This was a formative evaluation of workstation organization and staffing. Each exercise went through several Level 2 QAXs to refine the exercise and workstation instructions and to gain the information needed to develop the TSPs. Division, brigade, and battalion orders were checked and refined during the Level 2 QAXs. At the conclusion of the Level 2 QAXs, the SIMBART team was satisfied that the orders were tactically sound, worked on the simulation, and accomplished the assigned missions. The team completed the orders in early July and submitted them with the initial TSPs in mid-July. Partial mission outlines for these exercises are located in Appendix D.

The Level 3 QAX for the ADEF was conducted in early August. The Level 3 QAX was the first time the VTP O/C team had an opportunity to review the ADEF order. The VTP O/C team had many suggestions on how they would prefer to conduct the mission. The COR instructed the SIMBART team to change the exercise course of action to that recommended by the VTP O/C team.

During the remainder of August, the SIMBART team rewrote the ADEF orders for the brigade and all four battalions. Once the revised schemes of maneuver were written, the SIMBART team changed the prepared routes of march and positions within the Janus simulation and ran the simulation to verify the positions and movement of all forces. The SIMBART team also verified that the scheme of maneuver produced the desired results for each battalion and for the brigade as a whole. The SIMBART team then rewrote the controller and interactor instructions for all functions required. After writing the instructions, the SIMBART team verified the controller and interactor instructions by running through a series of exercises on the simulation. The SIMBART team then prepared the new TSPs for the Level 4 QAX conducted in early September.

The Level 3 QAXs for the DAK and the MTC exercises were conducted in early October 1995. The VTP O/C team recommended some changes in the brigade scheme of maneuver that required minor modifications to the orders and TSPs.

Training Support Packages

Development

The TSPs for the brigade staff training exercises were to be based upon the SIMUTA TSPs. However, the TSPs developed for SIMUTA differed in their organization for the SIMNET and Janus exercises. A follow-on contract through ARI required a contract team to develop a battalion DAK exercise and to change the SIMUTA exercises to be based on the SIMBART brigade orders. This effort was called SIMUTA-Battalion Exercise Expansion (B).

The SIMBART team worked with the SIMUTA-B team to develop a standard organization for the TSPs.

The standard organization of the TSPs consists of five volumes. Volume I is a training guide for the O/C team. This volume explains the training program from the trainer perspective. It also provides general guidance in preparing for and conducting the training. Volume II is directed at the training unit, and explains the training program from the training unit commander's perspective and provides guidance in preparing for and conducting the training. Volume II contains an outline of each exercise and the orders and graphics for each mission. Volumes III, IV, and V contain everything needed by an O/C team for the MTC, ADEF, and DAK missions, respectively. Further volumes can be added for any additional missions. The teams provided the standardized organization to the programs' COR in December 1994.

The SIMBART team recognized that TSPs for the brigade staff training exercises would have to be in the form of an easy-to-understand, self-instructional manual and job aid for each function. By examining the potential use of brigade staff exercises, it was determined that an O/C team would conduct a SIMBART training mission only once a year. Additionally, it was determined that the training would usually be conducted by O/Cs at locations other than the Fort Knox ARPA Janus site. In any case, O/C teams would have to become familiar with the selected exercise(s). The SIMBART team concluded that O/C team training would have to be short and not require substantial knowledge of the exercise.

To address the training audience's needs, a form of individualized instruction for each exercise support function was proposed. The SIMBART team found that Training and Doctrine Command (TRADOC) Regulation 25-34 (Department of the Army, 1993) authorized the use of structured writing (Romiszowski, 1986; Horn, 1973) for preparing TRADOC administrative publications. Structured writing was developed by Robert E. Horn and his collaborators. The specific techniques developed by Horn are called "Information Mapping." This name is now a registered trademark of Information Mapping, Inc., of Lexington, Massachusetts. The SIMBART team used the software methodology obtained from Information Mapping, Inc.

According to TRADOC Regulation 25-34 (Department of the Army, 1993), the structured writing method affords the following when used properly:

1. Information is separated into small units by purpose or function so the publication user can easily read and understand the information.
2. Information is sequenced based on its use and need by the publication user.
3. Topics are identified clearly to support scanning.
4. Information is presented in modular units that can be isolated and changed quickly.

This method is purported to have the following advantages for writers: (a) more efficient writing and higher productivity, (b) superior organization of material, (c) user-focused documents that address individual needs, and (d) improved analysis and understanding of information. Publication users can benefit by having: (a) decreased reading time, (b) less errors in task performance, and (c) better recall or relearning of task procedures. Thus, structured writing provided the mechanism for presenting the O/C team training in a workbook format that could be read and then used as a job aid during training.

Developing individualized instruction for each function of the O/C team using structured writing had several major effects on the program. First, the development of the individualized instruction was very labor intensive. Second, this development technique requires individuals trained in preparing this type of instruction and the SIMBART team was not staffed with an instructional developer. Third, changes in the structure of the training required that the detailed individual instruction be changed as well. In all, these requirements resulted in the development of individualized instruction which was very labor intensive.

The team began to prepare detailed instructions for the controller and interactor cells. During the Level 1 QAXs and early Level 2 QAXs, the SIMBART team wrote unit control instructions. The team converted these free text instructions to the structured writing format for one TF and the opposing forces (OPFOR) for a late Level 2 QAX. Outside personnel who helped in the Level 2 QAX used these instructions. The SIMBART team found that the controllers and interactors preferred the structured writing to other formats. When individuals who had used the materials worked with a different TF that did not have the structured writing instructions, they reported that the nonformatted materials were less effective in explaining what they were supposed to be doing. Thus, it was determined that the structured writing format would be effective in preparing an O/C team to conduct the exercises.

For each workbook, the SIMBART team also developed a form with a series of evaluation points to examine performance. The team keyed these evaluation points to the workstation or function's critical activities. The SIMBART team developed this form to help focus the O/C team members to the critical activities necessary for the unit to receive good training. The team expected these forms to be used for either a self-evaluation or for quality assurance checks by members of the O/C team.

Initial Delivery of TSPs

The initial TSPs were delivered to the COR in mid-July 1995. Up to this point, the team had concentrated on developing the MTC exercise which was very close to being completed. All of the interactor and controller instructions were prepared and written in the structured writing format. The instructions for the controllers and interactors for the DAK and the ADEF were not as complete. The SIMBART team received no feedback on the initial TSPs.

Refinement of TSPs for Final Delivery

Immediately after the Level 4 QAX for the ADEF exercise, the SIMBART team began refining Volume IV for final delivery. The team applied the lessons learned during the Level 4 QAX to the other two exercises. As a result, many refinements to Volume IV applied to

Volume III and Volume V. Thus, the TSPs used during the Level 3 QAXs for MTC and DAK included some lessons learned during the Level 4 QAX for the ADEF. The SIMBART team started to refine Volume III and Volume V after the Level 3 QAXs in the second week of October.

Refinement of TSPs after VTP O/C Team Review

After delivering the last of the final TSPs on November 7, 1995, the SIMBART team's attention was turned to the VTP O/C team's review comments. Because of the scheduled training of the VTP O/C team and representatives from the Georgia and Idaho ARNG from November 13-15, the SIMBART team had to make all possible corrections in the time available and reproduce the TSPs for distribution during the training sessions. As a result, the team tackled one mission volume per day during the week of November 7. The team distributed Volumes I and II on November 13. Volumes III, IV, and V were distributed with accompanying graphic overlays on the morning of November 15.

Observer/Controller Team Staffing

Development

Figure 1 graphically portrays how the Higher and Adjacent Control Cell (HACC) and the TF cells surround the training audience. All of the battlefield information provided to the training audience must come from the HACC, Fire Support (FS), CS, CSS, or TF cells. The HACC interacts with and provides information that the brigade staff would expect from the division and the brigade's adjacent units. The TF cells interact with and provide the brigade staff information it would expect and need from its subordinate units. The FS, CS, and CSS cells interact with and provide brigade staff the information it needs and expects from its supporting units. The OPFOR, TF, FS, CS, and CSS cells interact with and control the simulation. These cells provide information from the simulation to the brigade staff. Thus, all information that comes into the brigade staff comes from someone in the O/C team cells. The Exercise Director assisted by the Exercise Controller supervises and controls all cell activities. Figure 2 illustrates the structure of the O/C team in the conduct of a brigade training exercise.

The staffing needed for an O/C team to conduct the brigade staff exercise is shown in Figure 2 and Table 1. The brigade staff exercise is extremely expensive in terms of manpower, with almost twice as many O/Cs as there are personnel being trained. The O/C team must have experienced and knowledgeable personnel to provide the quality of information required by the brigade staff and to observe and provide feedback to the brigade staff. The quality of personnel assigned to the O/C team determines the quality of the training provided to the unit.

Composition

The following comments discuss the composition of the cells and some requisite capabilities the people assigned should possess. These comments on the composition and requirements are based upon the original SIMBART team estimates and the lessons learned during the program.

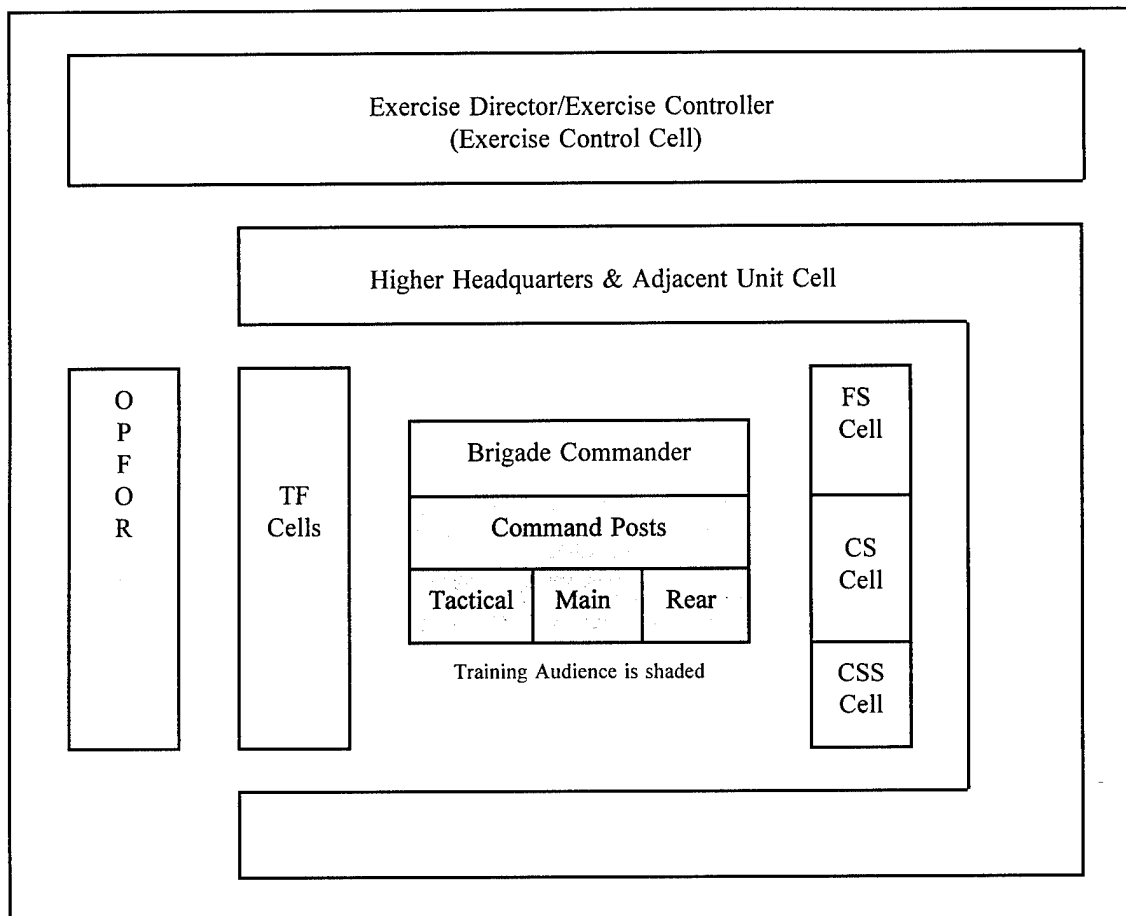


Figure 1. Brigade staff exercise structured training concept.

Exercise Control cell. The Exercise Control cell consists of the Exercise Director and the Exercise Controller. The Exercise Director is typically the senior person on the O/C team. The Exercise Controller directs and supervises the activities of the entire control team. The control team consists of everyone except the observers and the Exercise Director.

Battlefield Damage Assessment (BDA) cell. This cell was added after the last QAXs. During the QAXs, the SIMBART team noted that the maneuver cells were not able to provide an acceptable level of BDA to the brigade staff. The SIMBART team realized that a work-around was needed because the simulation did not provide the information required at the friendly maneuver workstations.

The solution was to create a cell of three individuals to pass BDA information to the maneuver workstations. They are located as follows: one at the controller workstation (CONWOR), one within the OPFOR cell, and one floating among the friendly maneuver cells. The person at the OPFOR cell passes OPFOR loss information over the control net. The floating person passes the OPFOR loss information to the appropriate maneuver cell. Additionally, the floating person passes friendly losses over the control net. The person at the CONWOR tracks both friendly and enemy losses. This information can then be available to the observers to verify BDA tracking by the staff.

SIMBART Exercise Support Schematic

Personnel and Relationships

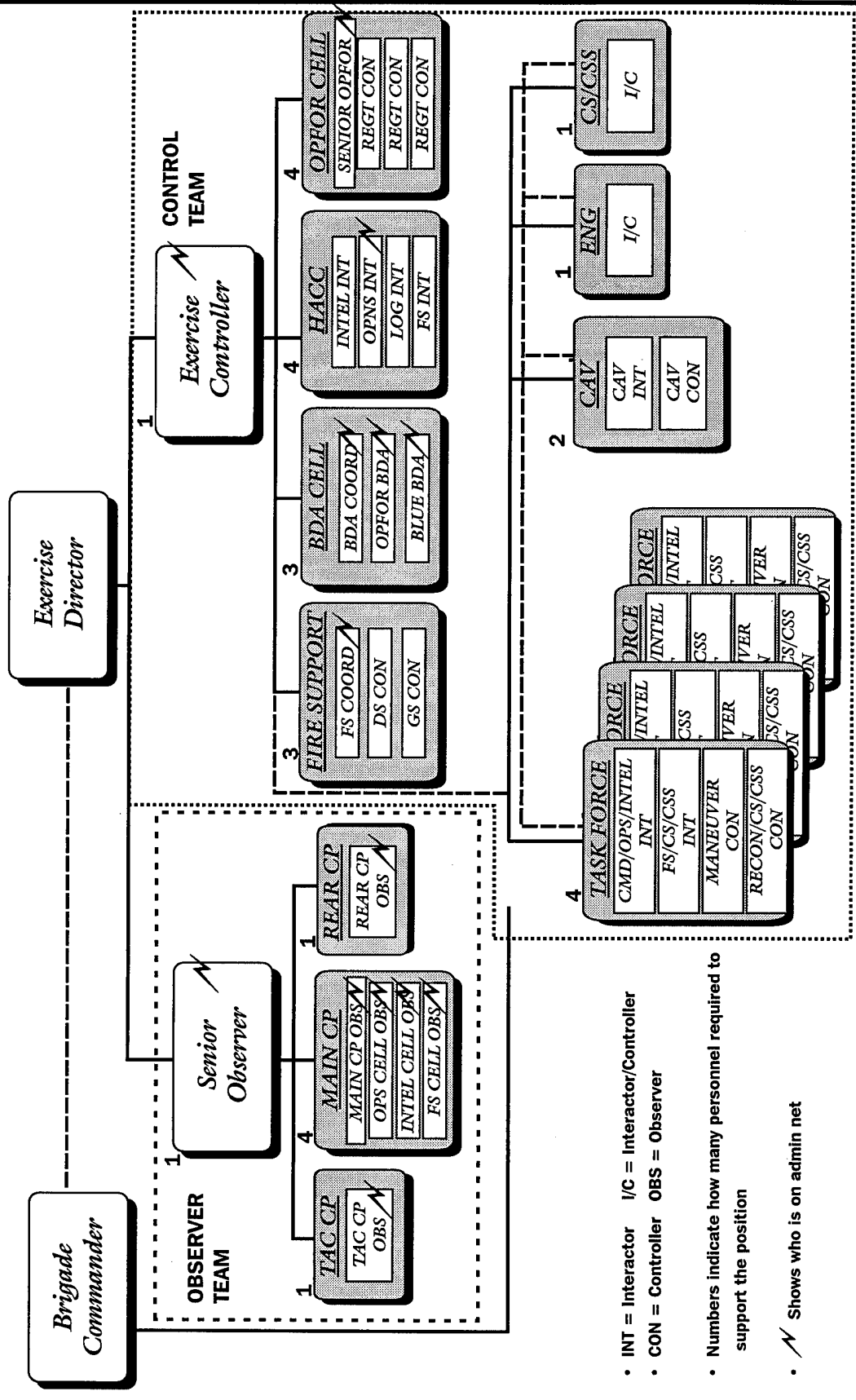


Figure 2. SIMBART exercise support schematic.

Table 1

O/C Team Staffing Requirements

# Workstations	Controllers	Interactors	Observers
Controller Workstation (1) Host & Server (2)	<u>Exercise Control Cell</u> 1 - Exercise Director 1 - Exercise Controller 2 - BDA	<u>HACC</u> 1 - Intelligence 1 - Operations 1 - Logistics 1 - FS (Division Artillery)	<u>Brigade Observer Cell</u> 1 - Senior Observer 1 - Tactical (TAC) Command Post 1 - Intelligence (TAC) 1 - Operations (TAC) 1 - FS (TAC) 1 - Main Command Post 1 - Intelligence (Main) 1 - Operations(Main) 1 - FS (Main) 1 - Rear Command Post
FS Cell (2)	1 - FS (Direct Support) 1 - FS (General Support & Close Air Support)	1 - FS (Field Artillery Battalion)	
CS/CSS Cell (1)		1 - CS/CSS controller/interactor (C/I)	
Engineer Cell (1)		1 - Engineer C/I	
Brigade Commander Workstation (1)	1 - Brigade Commander Workstation Controller		
OPFOR Cell (3)	1 - Senior OPFOR 4 - OPFOR 1 - BDA		
TF FALCON Cell (2)	1 - Maneuver 1 - CS/CSS	1 - Commander 1 - S2 Section 1 - S3 Section 1 - S1/S4 Sections 1 - Fire Support Element	
TF OUTLAW Cell (2)	1 - Maneuver 1 - CS/CSS	1 - Commander 1 - S2 Section 1 - S3 Section 1 - S1/S4 Sections 1 - Fire Support Element	
TF SEAHAWK Cell (2)	1 - Maneuver 1 - CS/CSS	1 - Commander 1 - S2 Section 1 - S3 Section 1 - S1/S4 Section 1 - Fire Support Element	
TF EAGLE Cell (2)	1 - Maneuver 1 - CS/CSS	1 - Commander 1 - S2 Section 1 - S3 Section 1 - S1/S4 Section 1 - Fire Support Element	
B - 14 CAV Cell (1)	1 - Controller	1 - Troop Commander	
Total Workstations - 20	Controllers - 22	Interactors - 28	Observers - 10
	Total O/C team - 60		

HACC². This cell requires a minimum of four highly qualified individuals. Each must know division capabilities within his/her functional area. Each must communicate routine messages and act as the primary divisional staff section officer in the functional area. These individuals must keep detailed logs of their communications with their brigade staff counterparts and evaluate the quality and timeliness of information passed by the brigade staff to the division. These latter functions were not performed during the QAXs and resulted in the omission of feedback in this area to the brigade staff.

The individual who performed the function of the HACC during Level 3 and 4 QAXs was very capable and energetic. However, the SIMBART team found that it was physically impossible for one individual to adequately transmit and respond to the radio traffic on all of the nets as needed to exercise the brigade staff. Additionally, he was not able to document and provide information about the quality and timeliness of information passed to the division over each of the division nets.

Observer cell. The skill level of the individuals in this cell is far more critical than any of the other cells. Each individual in this cell must be technically competent at the brigade level, skilled in observing performance, and skilled in AAR facilitation. According to Army Training and Evaluation Program (ARTEP) 71-3 Mission Training Plan (MTP) (Department of the Army, 1988), the observer should be at least equal in rank to the senior individual in the area he/she is observing and should hold or have successfully held the position of that senior individual. During the QAXs, captains experienced discomfort in conducting AARs for sections led by lieutenant colonels.

The SIMBART team increased the recommended number of observers from the original design and from what was recommended for the last QAXs. During the Level 4 QAX, the VTP O/C team positioned an FS observer in both the Main and the Tactical (TAC) CP. This proved to be very effective because both sections were observed, and observers discussed their observations during the exercise. As both sections were observed, the complete activities of the brigade FS element could be discussed during the AAR. On the other hand, there was no observer for the S3 section in the Main CP and no S2 observer in the TAC CP. As a result, these two sections did not receive adequate feedback. In the SIMBART team's concept, the TAC CP observer observed all activities in the TAC CP and provided information to the section observers located in the Main CP. Based upon the Level 4 QAX, the SIMBART team concluded that the TAC CP observer could not adequately perform the entire task.

An additional area for feedback occurred during the Level 4 QAX. This area concerned the layout and functional roles of individual staff members within each section. The observers discussed so far attended to the analysis of information, decision-making, and making of recommendations. However, observations from the SIMBART team point to the importance of providing feedback on job performance to the section noncommissioned officer-in-charge (NCOIC), the radio-telephone operator, and the map-poster. During the

²This cell should be labeled as an interactor cell. However, in the development and in the TSPs, this term and the acronym have been used.

Level 4 QAX, the S3 NCOIC conducted this AAR for the Main CP and took action to restructure how the sections performed while the senior staff officers were involved in the AAR process. (The best time for this AAR is immediately after the exercise so that the unit can make needed changes before the next exercise.) Because most observers listed in Figure 2 and Table 1 participate in or observe the brigade staff AAR, they are not available to conduct this AAR. Based upon the SIMBART team's observations during the Level 4 QAX, the unit wants and needs assistance in this area. Additional staff NCOIC/sergeant major (SGM)-type observers could be added to meet this requirement.

FS cell. During the QAXs, the SIMBART team expanded the FS cell from one workstation to two workstations. One workstation controller is assigned all the direct support (DS) FS assets. The other workstation controller is assigned the general support (GS) and close air support (CAS) assets. The individuals assigned as workstation controllers must know FS functions. The interactor must role-play the DS artillery battalion commander and fire direction center. This interactor must decide whether to fire each requested mission. Additionally, the interactor must decide when to maneuver the artillery assets.

Engineer cell. This cell is very important during the ADEF and DAK exercises. The personnel assigned to this cell must be extremely proficient in employing engineer assets and obstacles within the Janus simulation. The C/I must communicate obstacle status and execution to both the brigade staff and the involved TF cells.

CS/CSS cell. This cell is not used heavily in any of the exercises. One individual with knowledge of CS/CSS operations and moderate skills in Janus workstation operation can perform the functions for this cell.

OPFOR cell. The original design placed four controllers in this cell (senior OPFOR and three regimental controllers) for the MTC and the ADEF missions. Fewer controllers were required for the DAK mission. During the QAXs, the SIMBART team observed a requirement for an individual to monitor and control the divisional assets (division artillery and the second echelon tank regiment). Individuals assigned to the OPFOR cell should know the OPFOR tactics contained in the Heavy opposing force (OPFOR) tactics handbook (Department of the Army, 1994) and be proficient Janus workstation operators.

Experience has shown that OPFOR personnel may, over time, begin to concentrate too much on winning or defeating the training unit. This was a concern of the SIMBART team because overly focusing on defeating the training unit may be a training detractor. The OPFOR cell must maintain the concept that their mission is to accurately portray the OPFOR unit to generate the cues needed to train the brigade staff. Defeating the training unit is not the mission.

Maneuver cells. The maneuver cells are composed of two controllers and up to five interactors. Each controller has his/her own workstation. One workstation controls all four maneuver companies/teams. The other workstation controls the scouts, fire support team vehicles (FISTVs), mortars, engineers (if assigned), and the TF trains. The controllers should be proficient in performing tasks on the Janus workstations. Knowledge of company and battalion maneuver is required. During the QAXs, a wide variety of controllers participated.

Most of the controllers could perform at an adequate level after going through the training and rehearsal. The SIMBART team observed that the controllers had problems using mortars and maintaining cohesive unit formations. Several controllers conducted piecemeal attacks and maneuvers that resulted in poor loss-exchange ratios.

The interactors communicate with the brigade staff and the FS cell over five radio nets (three brigade nets - command, operations and intelligence [O&I], and administration and logistics [A&L]; and two field artillery nets). The interactors must role-play an entire TF staff in passing information from the simulation to the brigade staff. The initial design assigned only two interactors to each cell. The outcome of the QAXs indicated that two very competent individuals could adequately perform these functions. During the initial Level 3 and Level 4 QAX, only two interactors were assigned to the TF maneuver cells. Some of these individuals were not experienced in battalion staff operations. As a result, all of the nets were not used as designed and the reports were often incomplete, inaccurate, and not timely. This had negative training results for the brigade staff. During the later Level 3 QAXs, the TF cells were manned by four or five junior captains. Although the reporting was below the SIMBART team's expectations, the reporting and use of nets improved from the earlier QAXs. The staffing in Table 1 calls for five interactors (commander, S2, S3, fire support officer [FSO], S1/S4). Each interactor should be an experienced battalion staff officer in the function he/she is role-playing.

Maneuver cells could be staffed by members of subordinate battalions. These cells would still be members of the control team and would have to follow the cell workbooks during the exercise. These cells would be required to participate in the training and O/C team rehearsals, and would not be allowed to free-play the exercise. There would be an additional danger of diverting attention from the staff training to tactics if the cells were included in the brigade staff AAR. In discussions with the brigade command group after the Level 4 QAX, the command group did not consider the use of their battalion commanders and staff in the brigade staff exercises to be the best use of their battalions' training time. Because of the danger of diverting attention away from the brigade staff's training and the limited training benefit for the battalion staff, the SIMBART team does not recommend the use of actual battalion staffs for training.

After Action Review Development

The AAR concept was developed gradually over the course of the program, evolving as new ideas emerged and were shared within the SIMBART team. The emphasis on process was a conceptual underpinning and was coupled with the recognition of the need to narrow the process to a manageable number (3-7) of items for the observers to use during training execution and the AAR process. This led the SIMBART team to concentrate on the brigade commander's decision points. During any exercise, the SIMBART team concluded the brigade commander should have to make no more than five key decisions. After deciding what to look for, the SIMBART team then had to decide how to look at the decision points. For this, the SIMBART team went to Olmstead's (1992) adaptation of the Schein's (1965) adaptive-coping cycle (see Figure 3) that centers on decision making.

The next step was to determine how to conduct the AARs. Initially, the SIMBART team used the traditional AAR model of building from the smallest element to the largest element. Based on lessons learned from the SIMUTA project, the SIMBART team recognized the need for the AAR process to focus on corrections needed for the next training execution. To better support this, the SIMBART AAR model shifted to a process characterized by passing changes from the top (i.e., the commander) all the way down to the individual cells. This process required time after the AAR to analyze how changes would be implemented. While an improvement to the traditional AAR model, there were problems with this model as well.

The first problem was time. The process of conducting AARs from the smallest staff element to the entire brigade staff was time consuming, although also very necessary for the training process. However, based on the SIMUTA experience, the brigade staff was not prepared to rerun the exercise after completion of the brigade staff AAR. The commander and primary staff officers still needed time to work on improving performance for the next execution. After the primary staff officers received the commander's guidance, these officers went back to their staff sections and worked with other section members on ways to implement the commander's guidance within the section. The staff cells then worked out procedures to implement this guidance. In the SIMUTA project, this process took almost as long as the AAR process.

It was at this point that it became apparent that there was a fundamental difference between the SIMBART team's concept of the purpose of an AAR and the way the O/C team was planning for the AARs to be conducted. The SIMBART team felt that most of the time in an AAR should be spent determining how to improve performance for the next exercise execution. However, most of the time in an AAR was used to discuss what had happened during the exercise. The SIMBART team understood that the staff's job was to support and assist the commander. This fact puts the desires of the commander at the forefront. This, coupled with the focus on the decision points, led the SIMBART team to the position that the AAR process should start with how well the staff supported the commander at these decision points and how the commander wanted the staff to support him at these points. Thus, the start of the AAR process was at the brigade staff level (the largest element) and flowed down to the smallest element. The AAR process focused on how to implement the commander's desires concerning the staff, how the executive officer (XO) or battle captain wanted the sections to interact within the CP, and how the section leader wanted the section to work to support the commander. The SIMBART team required the brigade staff to be ready to execute at the end of the AAR process. The intent was to immediately try out the fixes worked out in the AAR process.

The SIMBART team started with these concepts and developed an AAR time schedule and data collection forms to support the concepts and AARs. For the initial delivery of the TSPs, the SIMBART team submitted the AAR time schedule. Preliminary data collection forms for the senior observer and outlines for the other observers were completed before the first Level 3 QAX in early August. Further refinements were made to these forms for the Level 4 QAX and the subsequent Level 3 QAXs.

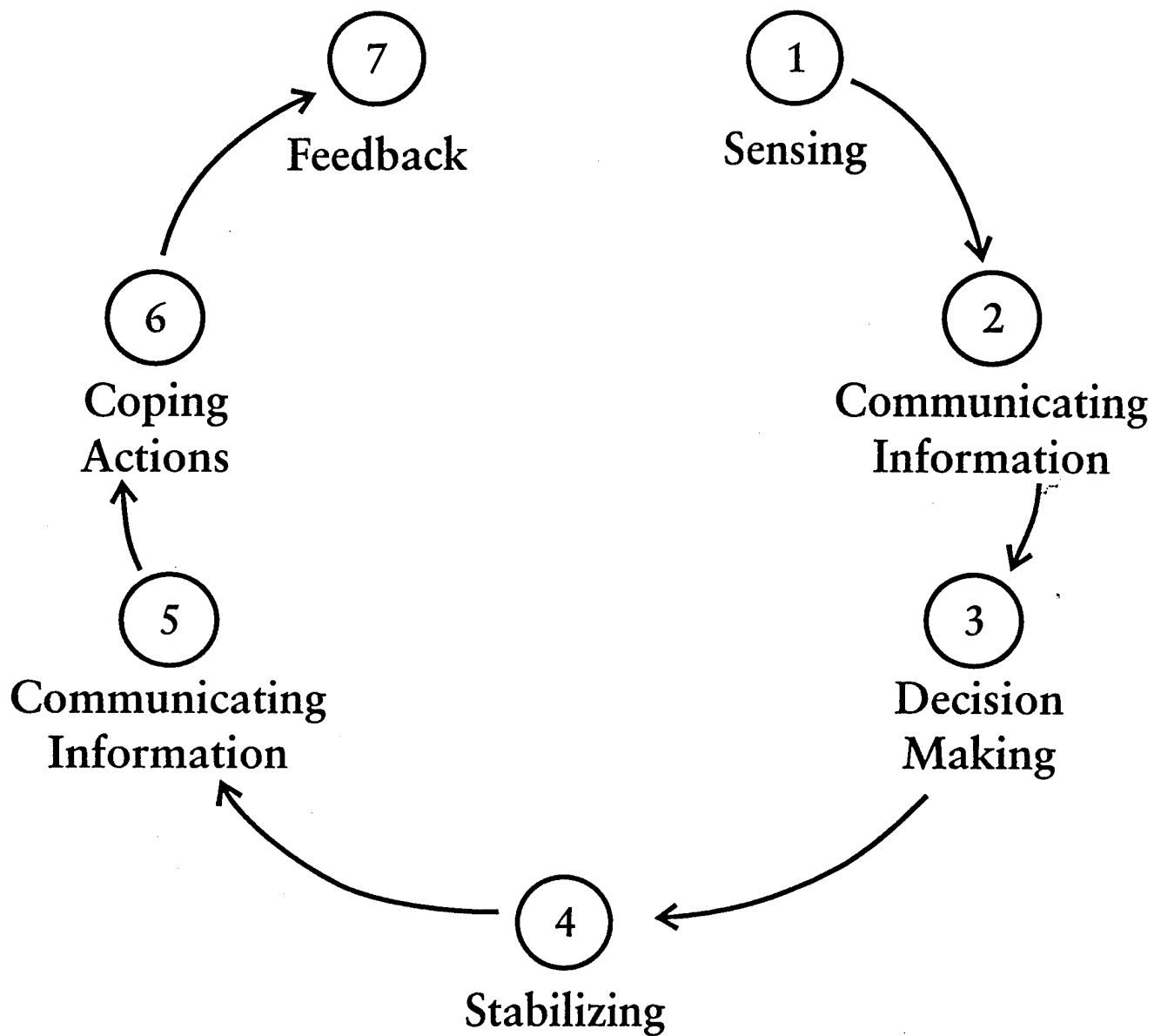


Figure 3. Olmstead's adaptation of Schein's adaptive-coping cycle.

Pilots and Trials

Scheduling Level 3 QAXs

In late May, the COR determined that Level 3 QAXs could not be supported during the June and July window. As a result, most of the work shifted from the SIMBART project to helping the SIMUTA-B project accomplish its task of developing a battalion DAK exercise in SIMNET and Janus. Some members of the SIMBART team continued work on the SIMBART DAK exercise that had fallen behind schedule. Other SIMBART team members continued to develop the workbooks. All SIMBART team members began working again on the SIMBART project after an approximate 30-day period.

In mid-July, the COR determined that the Level 3 QAXs that had been scheduled for late July and early August could not be supported by the government. As a result, the COR and SIMBART team developed a new time schedule. This time schedule called for a Level 4 QAX supported by an ARNG brigade to be conducted in early September. The Level 3 QAX for this exercise would be conducted during early August. The material for the unit would be prepared and sent to the unit during early to mid-August. Level 3 QAXs for the other exercises were planned for early October. The initial TSPs were scheduled to be turned over to the COR in mid-July for review. In mid-July, the supporting ARNG brigade selected the ADEF as the mission it wanted to conduct. The SIMBART team ceased most work on the other exercise TSPs and concentrated on developing the ADEF TSP.

Level 3 QAX for ADEF

The SIMBART team conducted a training session for the VTP O/C team and then assisted them in running the ADEF exercise during the week of August 7. Members of the FXXITP COBRAS, SIMUTA-Digital (D) (a contract team charged with converting the SIMUTA products for use with digital equipment), and SIMUTA-B teams served as the brigade staff for this exercise while the SIMBART team observed the exercise.

The brigade staff positions were manned at a skeletal level because only a few people were available for these roles. Even with the limited staffing, the SIMBART team planned to observe how well the interactors provided the brigade staff with exercise message traffic. Additionally, the SIMBART team expected to obtain information about the complexity of the exercise support and how well the O/C team staffing could handle the conduct of the exercise. Limited returns on the AAR process were anticipated because of the limited brigade staff structure.

Formative evaluation results for the Level 3 QAX for ADEF were positive. Most control cells could perform their functions. However, the control cells did not fulfill all their requirements. The SIMBART team concluded this was due to the filling of the control cells with less experienced personnel than requested. Message traffic from the TF cells was incomplete, often inaccurate, and not timely. Observers were not proactive in trying to improve the quality of the message traffic from the cells. Quality of the message traffic was attributed to the grade and experience level of the cell members. Cell staffs that more closely

followed the staffing design tended to perform better. Based on these results, the designed staffing levels should adequately support the exercise.

The training facility did not meet the training needs. Based on analysis of the communication requirements for a brigade staff exercise, the SIMBART team informed the COR that the communication capabilities of the ARPA Janus suite at Fort Knox were inadequate and required more than twice the radios currently available in the facility. Additional radios were not available for the Level 3 QAX. As a result, the SIMBART team, with the approval of the COR, modified the exercise by eliminating the A&L net and the brigade Rear CP.

Additionally, the SIMBART team informed the COR that the CP configuration in the facility was far too small to accommodate brigade staffs during an exercise. The facilities available could support the TAC and the rear CPs. The Main CP required a larger facility. Because of the reduced staffing for the Level 3 QAX, the available facilities were adequate for this exercise.

The training and the exercise worked well. However, Armor School representatives preferred a different scheme of maneuver and recommended changes to incorporate those preferences. As discussed earlier, the SIMBART team was directed to make these changes. Because of the directed changes, the SIMBART team returned to the design phase to develop a credible tactical plan. After the new tactical plan received approval, the team began the development process for the ADEF again. The team devoted the rest of August and early September to the development of the training support materials for the ADEF Level 4 QAX scheduled for September 8-9.

Level 4 QAX - ADEF

The VTP O/C team served as the O/C team for the Level 4 QAX. The SIMBART team requested that the VTP O/C team go through the O/C team train-up recommended in Volume I before conducting the exercise with the unit. Because of schedule conflicts, not all members of the VTP O/C team were available to go through the training. As part of the training, members of the SIMBART team tested various methods of reviewing the workstation books. Of the methods tried, the proctored study hall, with a detailed map exercise using the workbooks, resulted in the best training.

An ARNG brigade staff served as the training audience for the QAX. The brigade staff arrived and set up their CP areas on Friday, September 8. For this QAX, the government furnished part of an adjacent room for the Main CP. The brigade staff was unable to replicate its normal set up because of a lack of map boards. The government provided additional radio support. The brigade O&I net was on a frequency modulated (FM) radio net using standard Army radios. The other nets were on citizen band (CB) channels using the ARPA Janus and Army Janus CB radios. During the first run of the exercise, the brigade staff was unable to communicate with any of the TF cells over the FM radio net. The exercise support staff remedied this situation between the exercises.

One member of the brigade staff commented that he expected the Armor School to have a model CP set up for use during the exercise. This staff member added that the brigade staff was looking forward to seeing this model CP so that they could take ideas for improving their configuration back to their home station. The brigade staff provided a schematic to the SIMBART team on how they wanted to set up their CP before the exercise. This schematic had been copied from Field Manual (FM) 71-123 (Department of the Army, 1992).

Level 3 QAXs for MTC and DAK

The Level 3 QAXs and the training for the QAXs for the MTC and the DAK missions were conducted on October 10, 11, and 12. The VTP O/C team served as the O/C team for both Level 3 QAXs. Members of an Armor Officer Advance Course (AOAC) were the brigade staff and augmented the TF and other maneuver and support cells. The AOAC class manned the brigade Main CP with five officers (three U. S. Army captains and two allied officers with limited English communication skills). Of the five, only three (the U.S. Army captains) participated. The TAC CP was staffed with five officers, all U. S. Army officers. Because of a shortage of radio nets, the Rear CP was not used. The TF cells were staffed at the recommended level in terms of the number of people but personnel lacked the experience level recommended. All AOAC class personnel stayed in the same roles for both Level 3 QAXs.

Lessons Learned

From the feedback received, the SIMBART training program was extremely effective. The comments and criticisms contained in this chapter center on how the training design and development process, training program and its implementation, and interactions between the contract team and government representatives could be improved for future efforts. The intent is to highlight those areas that are considered potential problem areas for similar projects or areas where, given another chance, the SIMBART team would have done something different. The areas discussed are: training evaluation, development, O/C issues, technology, and feedback.

The SIMBART team collected the results and feedback discussed in this chapter using a variety of methods. For the Level 3 and 4 QAXs, members of the SIMBART team were assigned to observe specific aspects of the implementation and the exercise. At the conclusion of each QAX, the SIMBART team's observers compiled their observations and gave them to the team's formative evaluator. In addition, all members of the O/C control team completed a questionnaire at the conclusion of the QAX. This questionnaire was directed at pre-exercise training, job aids, and the individual's perception of the adequacy of the training and job aids. Participants completed questionnaires that covered home station preparation, on-site rehearsal, conduct of the exercise, the AARs, and perceptions concerning the program's training benefit. The SIMBART team interviewed key unit members at the completion of the Level 4 QAX to get their perceptions of the training. Additionally, the SIMBART team conducted a group interview with the VTP O/C team after each QAX.

Training Evaluation

The results and feedback from the Level 3 and 4 QAXs suggested that the SIMBART training program has the potential for providing an outstanding training experience for the participants. The actual training experience is tempered by the preparation of the unit, the staffing of the CPs, the O/C team, the training environment, and the conduct of the training program. The participants responded that they received outstanding training during the Level 3 and 4 QAXs.

During every Level 3 and Level 4 QAX, SIMBART team observers recorded comments from the participants about the OPORD and how it should be changed. The SIMBART team and others working with or on the program realized that most participants would have a different way that they would plan to execute the mission. The SIMBART concept was for a staff to concentrate on the execution of an order rather than the planning for the mission. A key component of the unit's preparation for the SIMBART program must be an understanding that the focus is on executing the order provided. The commander and his leaders must understand and stress this point with their personnel. If this is accomplished, the unit can focus its preparation on understanding and preparing to execute the order rather than preparing its own plan. This remains a key concept of the VTP. The VTP O/C team and others associated with the program must ensure that participating units understand this concept. This concept must be stressed in all of the pre-exercise contacts and visits with training units.

Preparing to conduct a SIMBART mission takes time and effort by the unit. The ARNG brigade that participated devoted several training days in preparation. Unfortunately, some of this preparation was lost when the unit received the revised brigade OPORD after much of its preparation had been completed. Additional preparation time is required in setting up the CP. The configuration of the CPs at the Fort Knox Janus site hampered the unit's preparation and subsequent execution. The unit expected to enter a facility that would help them set up model CPs as illustrated in current doctrinal manuals. When these facilities were not available, the staff was forced to develop an alternate configuration that would maximize the available space and resources. Because of this, the training facility proved to be a training detractor.

The staffing of the CPs during the Level 4 QAX with an intact ARNG brigade staff supported training on staff processes. The various staff cells experienced how all the components of the staff had to work together. However, the staffing for the Level 3 QAXs was inadequate for many staff interactions and the participants did not gain the experience in staff actions that could have been provided within the exercise.

The results of this training evaluation and previous experiences indicate that the O/C team is the key determinant to the quality of training. The senior trainer must select the proper personnel and provide these people with the training and resources required to prepare for and conduct the exercises. During the QAXs, the O/C team was never staffed at the recommended levels. While the members of the O/C team performed admirably, their lack of experience could not be totally overcome. As a result, the full potential of the training program was never realized. It would be beneficial if the Brigade mission was recognized

and appropriate additional personnel, experienced at the Brigade level, were authorized for the VTP O/C Team.

Development

Creation of Structured Training

As stated in Hoffman et al. (1995) for the SIMUTA project, structuring a staff training exercise was more difficult than the lower echelon maneuver exercises. Hoffman et al. (1995) wrote that the battalion staff actions are less well codified in the ARTEPs and FMs than the maneuver elements. The SIMBART team also found that the division of tasks between the various CPs in the brigade is not well defined. The team found that the ARTEP tasks for each section were performed continuously within a staff section. The cues to perform the tasks were produced by the receipt of information into the staff section, or the staff sections could be proactive and seek the information.

The SIMBART team took a different track within the structured exercise. The team structured the exercise around the brigade commander's decision points. During each exercise, the brigade commander would have between three and five decisions. Based on these decision points, the team went back to Olmstead's (1992) adaptation of Schein's (1965) adaptive-coping cycle (see Figure 3) and the brigade commander's decisions became the decisions in the adaptive-coping cycle. Thus, the focus of the exercise was the staff activities that surround each of the brigade commander's decision points. Before each decision, the staff received, analyzed, and disseminated critical information, and, based upon the analysis, the battle captain made a recommendation to the commander. After the commander made a decision, the staff then tracked implementation of that decision. Within the context of the exercise, the O/C team controlled the information flow into the brigade staff through the control of the OPFOR and the higher, lower, and adjacent forces.

Reaction to Structured Training

As in the SIMUTA battalion-level exercises, the brigade wanted to develop its own order and then execute it. The brigade that participated in the Level 4 QAX and the AOAC class who participated in the Level 3 QAXs did not have a complete understanding of the concept behind the structured training. Both groups concentrated on the tactics associated with the order rather than what they as a staff had to do to help the commander in executing the order. In fact, not all of the key players in the VTP O/C team were totally aware of the concept behind the structured staff training. This became obvious during the AAR process. During the Level 4 QAX and the October Level 3 QAX AAR processes, the VTP O/C team concentrated on the tactics employed during the exercise and the commander's decisions rather than how the staff supported the commander in making the decisions. The fact that all of the training units and the VTP O/C team did not share the SIMBART team's concept for structured training indicates that either the SIMBART TSPs did not adequately convey the information or the participants did not receive the information.

Exercise Synchronization

The SIMBART team based their data collection forms and AARs on the brigade commander's decision points. The team discovered that the synchronization matrix and the training developer's exercise training event matrix must be completed so that this material can be drafted and tested during the Level 2 QAXs. This meant that the staff synchronization matrices and the developer's exercise training event matrices must be completed not later than the last Level 1 QAX. For the SIMBART effort, the team scheduled the staff synchronization matrices and exercise training event matrices verification to be the main focus of the last Level 2 QAX. The AAR data collection forms and AARs were then to be developed and tested within the Level 3 QAX. This schedule did not allow enough time to develop the forms or AAR guidance. As a result, the forms and AAR guidance were only shells for the Level 3 QAX. This did not allow the SIMBART team to properly evaluate the forms during the QAX and it did not provide the guidance needed by the O/C team.

Time Management

In developing structured training, at least 50% of project time must be devoted to developing the TSPs. For SIMBART, the actual development of the TSPs was done in the last four months. Even during the last four months, some tactical structure was changed, forcing the team to return to the design phase for that exercise. Developing the specific instructions for each function demands meticulous attention to detail to ensure that all of the functional area instructions blend and agree. For the SIMBART TSPs, the total instructions for the O/C team for one mission were approximately five inches thick. The SIMBART team developed these instruction books as an individualized instruction manual and job aid for each O/C team member. In total, the SIMBART team developed approximately 40 individualized training workbooks and job aids per exercise. The process of creating and refining these workbooks was extremely labor intensive. Because of the short time allotted for the development of the TSPs and the requests for changes in the tactical plan, the development, review, and refinement process were not as complete as the team would have desired.

Five Volume Exercise Package

The volume concept for the SIMBART exercise packages is a major improvement from the SIMUTA project. Since the SIMBART TSPs were to be exportable and serve as stand-alone products, the design of the volumes had to provide anyone assigned to conduct an exercise with all of the instructions and training needed. In the five-volume concept, Volume I provides the basic guidelines on what a brigade staff exercise is and what it takes to run one. Volume II is directed at the command group of the brigade staff who take part in the exercise. This volume provides an overview of the brigade staff exercise, requirements to conduct the exercise, and suggestions on how the brigade staff could prepare for the exercise. Volumes III, IV, and V are the mission volumes. Each of these volumes contain the detailed instructions needed by each member of the O/C team to perform his tasks. Volume I was not tested with an exportable O/C team audience. Volume II was given only a cursory look before and during the Level 4 QAX because of the lack of time provided to the unit to prepare for the exercise. Volume II was provided to the unit approximately one month before the trial. Portions of the mission volumes were tested during the Level 2, 3, and 4 QAXs.

Structured Writing

Initial feedback from the O/C control team during the Level 2, 3, and 4 QAXs was very positive. The individualized workbooks appeared to be very effective in explaining to a control team member how to perform his/her role in the training exercise. The O/C control team members' use and understanding of the individualized workbooks appeared best when a highly structured train-up plan based on the plan described in Volume 1 of the TSP was used. The SIMBART team's audience analysis suggested that the TSPs would be used mostly by an ad hoc O/C team at a Simulation in Training for Advanced Readiness (SIMITAR) program ARPA Janus site. The SIMBART team designed and wrote the TSPs for this audience. The ideal implementation trial would have had an ad hoc O/C team execute the training at one of these sites. Unfortunately, this could not be accommodated in the scheduling. The use of a more experienced O/C team did not provide a true evaluation of the effectiveness of the individualized workbooks.

The SIMBART team only partially carried out structured writing because team members were not formally trained in the application of structured writing. One member of the team attempted to provide an example for the other team members to follow. Because of the rushed development time, the team could not accomplish further refinement and application of some structured writing ideas. The final product was a marked improvement over the TSPs prepared during the SIMUTA program but could be further improved by using instructional training developers trained and experienced in preparing individualized instruction in a structured writing format.

Formative Evaluation/Development Methodology

The SIMBART project validated the methodology suggested in the SIMUTA project (Campbell, et al., 1995). However, the SIMBART project also modified some activities in Phase 3 - the Design Scenario and Exercise Outline. This modification was based on a different approach to conducting a formative evaluation. Campbell, et al. (1995) refer to quality reviews as their formative evaluation. In the SIMUTA project, quality reviews were conducted routinely at the end of an activity to evaluate the products of the activity.

During the SIMUTA project, the SIMUTA team learned the value of the formative evaluation and began to integrate it into its development. Campbell, et al. (1995) discussed the quality reviews at the end of activities within their methodology. In the SIMBART project, quality reviews were more involved in the development cycle. Since most of the SIMBART team members also worked on the SIMUTA project, they were aware of the formative evaluation process used in that project. In the SIMBART project, formative evaluation became a part of each individual's job.

The SIMBART team expanded the role of formative evaluation so that it was more in line with Rossi & Freeman (1989), who wrote that "formative studies provide insight into the problems an intervention may face and ways to overcome them" (p. 141). Thus, the SIMBART team conducted the QAXs to evaluate material and to gain insights for further design or development. The QAXs were a look back to check what had been developed and

a look forward to what still needed to be developed. As such, formative evaluations (QAX Levels 1, 2 & 3) were included in the design and development activities.

Good Idea Cut-off Points

There are always good ideas in any project. However, for every project there are certain times when schedules call for a stop to good ideas. All the good ideas up to that point are incorporated and any future ideas are recorded for use in later projects. In this project, the SIMBART team called these points of time - "Good Idea Cut-Off Points" (GICOPs). Unfortunately, the SIMBART project's contractually imposed GICOPs did not align with the GICOPs of other Army parties. As a result, it is now possible to identify some of these points and discuss their implications below.

Support for Trials

The pilot and trial resource commitment for government furnished equipment (GFE) and personnel was not clearly articulated in the original and revised SIMBART SOWs (ARI, 1994; 1995). In developing the SIMBART research plan (BDM Federal, 1994), the design report (BDM Federal, 1995a), and the modified design report (BDM Federal, 1995b), the SIMBART team did not clearly establish the resource requirements for the COR. This led to an ad hoc system of scheduling of resources with the deciding factor being the limited availability of the VTP O/C team personnel. Other factors contributing to the vagaries of scheduling resources were the availability of ARNG brigade staffs, the requirements of the AOAC, and competition with other programs such as Advanced Warfighting Experiments (AWEs), COBRAS, and SIMUTA-B. While a certain level of resource contention can be anticipated when dealing within an organization as dynamic as Fort Knox and the Armor Center, the degree of contention experienced by the SIMBART project caused significant diluting of project intent.

The resource contention problem was compounded when the SIMBART project was required to make a major change in training program design to accommodate revised government project objectives. This was even further compounded when the SIMBART and COBRAS projects were directed to come to a common scenario context at the corps and division levels and to achieve maximum congruence within the development of their respective brigade OPORDs. At that point, all scheduling of resources became a virtual barter system that caused degradation of all program development efforts. The net effect of redirection to the SIMBART project was the loss of the Level 4 QAX of the MTC and DAK TSPs. The Level 3 QAXs for these TSPs were postponed to such a late date in the SIMBART production schedule that the opportunity to incorporate lessons learned from the pilots was significantly reduced.

The lesson to be taken from the experience of the SIMBART project regarding resource scheduling and management is clear. Those agencies responsible for scheduling resources, facilities, and personnel should be included during the development of the GFE stipulations contained in the SOW. Just as the government routinely develops independent cost estimates, a government independent GFE estimate should be coordinated as a baseline for planning both by the proposing contractor and the supporting government agencies. As a

corollary to this, the COR, resource agencies, and contractor should have a resource coordination conference to establish primary and alternate schedule dates for all major resource intensive events such as Level 3 QAXs (pilots) and Level 4 QAXs (implementation trials). This coordination conference should also serve to block-schedule facilities and equipment for development purposes before the submission of a design report. The results of this effort would be formalized and documented by the standard request procedures for equipment, facilities, and personnel. This process would preclude violation of requirements such as the Fort Knox 12-week lead-time to schedule personnel and ensure manageable resource contention.

Unit Preparation

Initially, the SIMBART team planned for the unit to prepare the decision support template (DST) and synchronization matrix as part of its preparation for the exercise. However, after the Level 3 QAX, the VTP O/C team convinced the SIMBART team that the DST and the synchronization matrix needed to be part of the orders package. Thus, the SIMBART team prepared the DST and synchronization matrix and sent them to the unit with the VTP O/C team. The following two paragraphs provide rationales for developing the DST and synchronization matrix for the unit.

SIMBART training is based on the premise that the unit is not supposed to go through the planning process in preparing to conduct brigade staff training exercises. Therefore, the unit must have all the products, results, and tools it would normally prepare or develop during the planning cycle. For the Level 4 QAX, the brigade was given some of these tools late in its home station preparation. Without these tools, the brigade developed some of these instruments on its own. Two of the key tools were the commander's DST and the staff battle captain's synchronization matrix. As a result, the brigade expended time and effort that could have been devoted elsewhere. Additionally, the brigade staff made some assumptions when the information was not available that took it along different paths than intended. By providing these materials in the unit's mission packages, the unit could devote its efforts to preparing to conduct the exercise. The planning materials explain to the unit the thought processes used to develop the order. This helps the unit to understand the order and the guidance the commander provides to the staff.

Additionally, the DST and synchronization matrix provide the unit the standards or the guide on how to win the battle. This is because the SIMBART team controlled friendly forces and OPFOR. The difference between the SIMUTA and SIMBART projects is that in SIMBART, the team attempted to increase the possibility of a positive training experience by exercising more control over the conditions. The SIMBART team attempted to eliminate the possibility of gamesmanship by the members of the OPFOR control cell by adding this structure in the instructions and in the planning and preparation materials.

SIMBART Team Structure

The SIMBART team learned some very valuable lessons regarding what is needed in a team structure for higher level exercises developed using the structured simulation-based training methodology. The team needed additional personnel skilled in two areas:

Instructional Design and the Battlefield Operating Systems (BOSs). An instructional design specialist was needed to design and develop the individualized instruction for each of the functional areas required in the structured exercise. In the SIMUTA project, there were not as many aspects to control during the exercise. Additionally, the SIMBART control team was much larger than what was required to run the battalion exercises developed for the SIMUTA project. The SIMBART team found that they needed to control far more aspects of the simulation than were required in the SIMUTA project. The team believed that this control could be gained by more tightly structuring the exercise through the development of detailed instructions for each function of the control team. Because of the requirement to export the TSPs and the fact that an O/C team may conduct an exercise only once a year, the SIMBART team developed instructional workbooks with instructions in the form of an individualized training program. These workbooks guided O/C team members rapidly through the requirements for each functional area.

The special functions within each BOS become more complex at higher echelons. The SIMBART team had to call on SMEs in field artillery, intelligence, engineering, and CSS to help develop the following: (a) orders, (b) planning, (c) higher and adjacent unit message lists, (d) OPFOR instructions, and (e) evaluation instrument focus. The team experienced some difficulties developing aspects of the training in these areas because some of the SMEs were not conveniently available.

Observer/Controller Issues

O/C Requirements and Responsibilities

The O/C team, whether it is the VTP O/C team or an ad hoc O/C team, is the key to the success of a brigade staff exercise. It helps the unit to prepare for the exercise and understand the exercise concepts. It sets the tone of the training session. It interfaces with the simulation and provides information to the staff about the battle occurring within the simulation. It reacts to the commander's orders, staff's instructions, and requests for information. The paragraphs below examine O/C requirements and responsibilities more closely.

Content. Both observers and interactors must be proficient in their areas. Observers must have the knowledge to be able to observe and compare the unit's performance against established standards. Additionally, observers must help units gain knowledge of and improve its application of staff tasks. As an observer, teacher, coach, and mentor, the O/C team observer must be an expert in all areas that he serves.

The interactor must be proficient in providing information to and responding to requests from the brigade staff. To do this effectively, the interactor must possess the content knowledge and the ability to communicate with the brigade staff. The proficiency of the interactors is a key to the success of the training exercise.

Technology. As in the SIMUTA exercises, the controller must know how to operate the Janus workstation. The project design relies upon the controllers being proficient before conducting the train-up for the exercise. Controller mistakes at the Janus workstation will not

be apparent to the training unit. Minor mistakes should not have a major influence on the training for the brigade staff as long as the controller can obtain information concerning the workstation forces for the interactor. However, some controller mistakes may have an impact on the commander's decisions and can cause the exercise to deviate from the designed structure.

Instructional techniques. Hoffman, et al. (1995) point out that the Armor Center needs to establish procedures for training or giving guidance to the O/Cs on teaching, coaching, and mentoring. Hoffman maintains that these skills are not easy to perform and that the O/Cs need instruction that includes practice and feedback. The authors recommend the establishment of a systematic on-the-job training program for teaching instructional techniques, coupled with a monitoring and improvement-planning system.

In the SIMBART TSP, the instructional techniques of teaching, coaching, and mentoring were mentioned but not explained. Members of the VTP O/C team expressed concern about what the SIMBART team meant by these terms and what the team's expectations were in the application of these techniques. The SIMBART team operated on the premise that the individuals chosen as observers for a brigade-level staff training exercise would be familiar with and trained on these techniques. The team recognized that this training was not in the scope of the SIMBART program nor would the time or resources be available for such a train-up program.

Related to the issue of O/C instructional techniques, Brown (1992) wrote about the "presence of trained, competent, motivated OC/Organizational Effectiveness (OE) personnel" (p. 4-2). Brown stated that these OC/OE personnel set the tone of the training. "Cold, aloof, critical, antagonistic OCs can negate the most promising training environment. The OCs are the mentors -- the experts who can encourage very positive learning by their expertise and attitude" (p. 4-2). The SIMBART team envisioned the O/C filling the role of mentor during the brigade staff training exercises.

Additionally, Brown (1992) noted the importance of OEs who are credible in assessing organizational competencies. The SIMBART team's concept required O/Cs who could perform some OE-like functions. This concept focused on the processes that should occur within a staff. With the structure of the training environment, the SIMBART team created observation collection forms that focused on processes that should be occurring at set time frames in the exercise. This concept presupposed technically competent staff personnel who lacked the opportunities to apply his/her competencies. The SIMBART exercises were designed to provide staffs with the opportunities to apply these competencies. The O/C team served an important role in feedback aimed at honing the staff as a functioning team. Thus, the ability to assess organizational competencies was important for the envisioned O/C team.

Brown (1992) envisioned the O/C as predominantly focused on technical competencies. He believed that an additional observer was required to focus on organizational competencies. He viewed the ability of an O/C to focus on both technical competencies and organizational competencies as possible theoretically, but probably not practical. The SIMBART team agreed with this assessment. However, with the assumption

that the staff was technically competent, the focus could be on organizational competencies and would be maintained unless the unit showed a lack of technical competence.

Relationships Between Contractors and Army O/Cs

The lessons learned from SIMUTA were:

1. The VTP O/C team needs to be available from the beginning of development.
2. Time for coordination must be scheduled.
3. The roles and responsibilities of both teams need to be clearly communicated.

Most of the lessons from the SIMUTA project (Hoffman et al., 1995) still apply. During the initial stages of SIMBART, some members of the VTP O/C team were available to review the material and discuss some program concepts on an informal basis though the SIMBART team had problems obtaining formal feedback from the VTP O/C team in the early stages of the program. During the middle of the contract period (March through August), the VTP O/C team experienced an almost complete change of personnel. All of the key leadership and senior positions were vacant at some time during this period. As a result, there was virtually no interchange between the VTP O/C team and the SIMBART team during this crucial period.

When the key military leadership was assigned to the VTP O/C team in August, any substantive feedback required major changes in the products already developed. The COR directed the SIMBART team to incorporate VTP O/C team comments from the Level 3 QAX into the SIMBART exercises. These directions returned the SIMBART team to the design phase of the development cycle. Making these changes meant that the SIMBART team had to stop all other development to complete the changes in time for the Level 4 QAX in early September. The VTP O/C team's first formal review of the TSPs was done on the final delivery product starting in late September. No formal feedback was received on the initial draft TSPs delivered in mid-July. As a result, the SIMBART team was asked to modify the final delivered TSPs. Some changes requested were substantive and concerned material and concepts approved by the COR as far back as December 1994.

As in the SIMUTA project, the roles and responsibilities of the teams were not clearly defined. The roles and responsibilities of the VTP O/C team in the SIMBART project should have been different than in the SIMUTA project. In the SIMUTA project, the VTP O/C team implemented the program. As such, the program was written for the VTP O/C team. The VTP O/C team was organized and staffed to conduct the programs for the platoon, company and battalion exercises. The VTP O/C team members were supposed to be SMEs for these exercises. In the SIMBART project, the VTP O/C team was not seen, at least by the SIMBART team, as the implementors of the program. The VTP O/C team was neither organized nor adequately staffed to conduct a brigade-level exercise. Few VTP O/C team members had brigade staff experience nor were they expected to be SMEs at the brigade level.

As in the SIMUTA project, the SIMBART team was charged with creating innovative solutions. Hoffman, et al. (1995) wrote, "A contractor team, being at least one step removed from the Army culture, may more readily be able to break prevailing mind sets" (p.148). They continued,

. . . creative solutions themselves may cause conflicts. Therefore, the contractor team and the VTP O/C team should perhaps expect to have to live with that conflict. At the same time, the O/Cs must be willing to give innovative ideas a fair test. Equally important, it then becomes incumbent on the contractor team to keep its innovations within reasonable bounds (p.148).

Some of these conflicts were realized during the SIMBART project. As in the SIMUTA project, a major area of conflict was in the conduct of the AAR. Innovations in this area are particularly difficult to implement in the pilots or implementation trial. The Army has published a general procedure or structure to follow for AARs (Training Circular 25-20, Department of the Army, 1991). Breaking from this structure presents risk to the O/C conducting the AAR and to the VTP O/C team's reputation. This is also the time when the O/C is "on stage." At this point, the program or the procedure can be directly attributed to the individual leading the AAR or his team. In order for innovations to occur in the AAR itself, the contractor must allow the O/C to become comfortable with the innovation and convince him that the innovation would allow the O/C to be favorably evaluated by the audience. This did not occur in the SIMBART project. The SIMBART team remained convinced that the change in the AAR structure would be effective and time efficient. However, the SIMBART team was not able to convince the VTP O/C team of this before the trials. As a result, the AAR structure presented in the SIMBART TSPs was never tested.

Program Control, Ownership, and Quality Management

Hoffman, et al. (1995) addressed the following two problems during the SIMUTA project: "(a) the O/Cs' time, during RCVTP development, was extremely committed, and (b) final responsibility for the quality of program implementation remained unclear" (p.148). The first problem remained during the SIMBART project. As discussed below, the reliance on the VTP O/C team to provide the product review and its non-availability at critical times created many problems. The second problem also remained. However, since the VTP O/C team may not have been the intended implementor, the problem may be somewhat different. For the SIMBART project, the problem was a question of who exercised the quality management role. During crucial periods, the SIMBART team was unsure of who was responsible for quality control. During May through early August, the government provided no tactical review of the material being developed. When the government finally provided this tactical review starting in mid-August, the government's suggestions caused the SIMBART team to return to the design phase and redevelop some material. As a result, the SIMBART team had to reorganize its efforts and concentrate on developing new material rather than refining the material already developed. The short time remaining in the contract to address the government's suggestions virtually eliminated the SIMBART team's ability to refine and polish the delivered materials.

The suggested remedy to this issue is to stipulate the parties responsible for the review of the materials and the calendar windows for the review process. This is discussed in more detail later.

O/C Team Training

The concepts of teaching/coaching/mentoring and how or if the VTP O/C team should use these concepts was discussed during a review of the material late in the contract. These concepts were foundations for the SIMBART and the SIMUTA projects. The fact that these may not be the accepted roles of the VTP O/C team was not an issue under this contract but does suggest an incongruence between the SOW (ARI, 1994) concepts and the implementation of the contract materials. The initial training and sustainment training of the VTP O/C team was discussed by Hoffman, et al. (1995) as an issue that needed to be examined within the VTP structure. It was evident from the Level 3 and 4 QAXs that the issue remains.

Program Trial and Implementation

AAR structure. The SIMBART program provides an innovative staff AAR structure that departs from the bottom up, tactics-focused AAR. This structure centers on developing the brigade staff to serve the brigade commander. From this viewpoint, the logical starting point for the AAR is the commander and his key staff personnel. During this AAR, the commander discusses with his key staff personnel what he needed from them before each of his decisions and how he wanted them to follow up on his decisions. The concentration is not on who did what wrong, but rather on what was needed and how it could be provided. This session becomes a learning and working-together session to refine and communicate the commander's expectations of his staff. At the conclusion of the brigade staff AAR, each CP meets to discuss how it, as a CP, can best meet these expectations. The AAR sessions are future-focused but draw on the staff's experience from the exercise.

The VTP O/C team did not use this structure during the Level 3 and 4 QAXs. The VTP O/C team insisted on using the "bottom-up, command-focused" AAR structure used at the Combat Training Centers (CTCs). Therefore, this innovative AAR structure was not tested during the program. The SIMBART team retained this structure in the TSPs because the team asserted that the commander-focused AAR structure is more effective for training staff processes than the tactics-focused AAR.

As discussed earlier, the SIMBART team did not provide the VTP O/C team with enough time to examine and become comfortable with the new AAR structure. As discussed by Hoffman, et al. (1995) concerning the SIMUTA project and earlier in this report's section on program management and control, no government representative provided oversight and exerted control of the implementation process. As a result, the SIMBART training exercises were not implemented according to their design.

Role of the observer. As described earlier, some observers did not perform their roles as coaches and mentors. Some difficulties may have resulted from the lack of experience and the rank structure of the personnel selected as observers by the VTP O/C team. As a result,

the VTP O/C team was not staffed or organized to conduct brigade staff level training exercises. The observers were at least one grade below the person in charge of the group they were observing. Additionally, none of the observers had served in the role of the senior person of that group. This placed the observers at an extreme disadvantage in trying to serve as teachers, coaches, or mentors. If the observer is to function as a teacher, coach, or mentor, the observer must have the rank and experience called for in the TSPs and FM 25-101 - Training the force: Battle-focused training (Department of the Army, 1990).

Data collection forms. Observers must be trained in using data collection forms. Further, observers are hesitant to use new, unfamiliar forms when they must conduct an AAR from the data collected. This relates back to the concept that observers must be comfortable with a new AAR structure before they will want to use that structure. Observers should be comfortable with the forms to the extent that they know that the information being collected will support the AARs. The forms must be designed to collect the information the observer believes he will need to conduct his AAR. If the observer does not accept that the forms will help him collect the information in a way in which can be easily used, the observer will collect the data in his own way. This means that personnel must be trained to use the forms. This training must address how the forms will support the AAR process.

Trial Locations

Level 3 and 4 QAXs were only conducted at the Fort Knox ARPA Janus facility. The export of the ARPA Janus files to an ARPA Janus site and the actual conduct of the brigade staff training exercises at one of those sites were not done during the program. As a result, some issues involved in conducting the training at a different site were not discovered. Additionally, the VTP O/C team conducted all the Level 3 and 4 QAXs. Since the VTP O/C team is a full-time, devoted O/C team, familiar with the structured simulation-based training concept, the issues associated with training an inexperienced O/C team were not discovered. The needs of a less experienced O/C team may be far different from the needs of the VTP O/C team. Because of these two issues, the SIMBART team recommends that at least one trial should be conducted at a remote site. A trial at a remote site would allow the team to formatively evaluate the export package using an actual site and a representative O/C team audience.

Technology

The Development of Training on Emerging Technology

Hoffman, et al. (1995) reported that simultaneous development of training with technology development is both a blessing and a curse. During SIMBART, the software continued to receive upgrades throughout the course of the project. The upgrades to the software program were, for the most part, counterproductive. During execution of the training program, several ARPA Janus revisions were developed and released by an ARPA support contractor. These revisions created several problems that are yet to be overcome. Most damaging was the random printing of battle damage reports over the workstation screen. This blocked the operator's view, interrupted input of instructions, and disrupted a messaging system designed to support a distributed implementation of Janus. This reduced the ability of

the program to maintain real time. Throughout the SIMBART project, engineering change proposals were submitted to correct these and other faults. These corrections were never accomplished and, as of the end of the SIMBART project's contract period, these faults still existed. Most notable in the software revision process was the fact that the primary training developers using the ARPA Janus system were not allowed to participate in the development of requirements for software upgrades and modifications. Consequently, many features that could have been developed to better support the VTP were not provided by the contract software developer.

A lesson learned is that when software systems are being upgraded as part of an overall program development, the requirements of all elements of the program must be considered in scheduling software revisions. This may be accomplished by either of two means. The first is to define revised software requirements initially to support the overall program and then have all software upgrades and revisions accomplished before initiating any other element of the program. Once the baseline software revision is established and other program elements commence their developments, the only changes or upgrades to the baseline allowed would be those necessary to correct execution or computational faults. No upgrades or modifications of program functionality would be permitted. The second means would be to develop training systems in parallel with software upgrades. This is a high-risk approach because training developments tend to progress at a faster rate than software developments. It is quite possible under these conditions that a training system could be designed that could not be supported by the software system. In either case, the requirements of the user community must be attended to by the software development team engineers.

Technical Support

Technical support to the SIMBART project was provided at two levels. The primary level of support was furnished by the Armor Center through the 5th Squadron, 16th Cavalry Regiment, ARPA Janus site team. These personnel were responsible for all direct support of the ARPA Janus simulation system. A secondary level of technical support was provided by ARPA in the form of software configuration control and upgrades for the ARPA Janus simulation software.

The ARPA Janus site personnel provided support with system operations and technical expertise for all SIMBART developmental exercises, pilots and trials of the TSPs. These personnel helped in file maintenance, supported file development, and assisted in the archiving of mission files. Additionally, they assisted the SIMBART team by actively participating as workstation operators for play of the OPFOR and friendly units during Level 1 and 2 QAXs.

The technical support provided through ARPA for the software system was inconsistent. The ARPA Project Manager's Office at Fort Leavenworth did provide a modified NTC terrain data base. This data base provided an expanded maneuver area for the forces.

Feedback

Review of Training Materials

Obtaining a review of training materials was difficult. As discussed by Hoffman et al. (1995) for the SIMUTA project, obtaining Army review of materials is difficult. For SIMBART, the review of training materials was incomplete due to pilot and trial schedule changes. It was initially anticipated that the review process would include a progressive series of internal and external reviews by the contractor team, the SIMBART project's steering committee, the COR, the VTP O/C team, and participating ARNG brigade staffs. The venue for the VTP O/C team and ARNG brigade staff review was expected to be the Level 3 QAX (pilots) and Level 4 QAX (implementation trials) of each of the three missions. This process would have allowed the SIMBART team sufficient time between each review to evaluate and incorporate the various review notes generated at each event. The process was corrupted by the synchronous and time compressed execution of the pilots and trials.

Besides the SIMBART team's review process, the team's OPORDs were subjected to ex-officio review by nonassociated contractor personnel and SMEs of various Army Schools and Centers. These reviews produced criticisms, comments, and directions that were of tactical merit but would have required major changes in the scope of the SIMBART project. Most reviews concentrated exclusively on the tactics of the operations and not on the TSPs as a training system. In general, reviewers were not knowledgeable of the requirements of the SIMBART SOW (ARI, 1994). These reviews ultimately caused the team to divert resources from the execution of the SOW (ARI, 1994) tasks to consider a multitude of independent opinions and personal preferences.

The lesson learned here is that qualified reviewers should be identified at the onset of a project and scheduled to participate in periodic reviews throughout the development process. A part of the qualification criteria for reviewers should be that they have complete knowledge of SOW task requirements and specific program objectives. Another helpful technique would be to provide reviewers with written guides that identify specific objectives for each review and provide instructions that keep the review comments within the scope of the project.

Tactical Plan

The government must complete its review and approval procedure on the tactical plan before the development phase is begun. This equates to the SIMBART team's preparation for the first Level 2 QAX. The team attempted to have the tactical plan approved during the initial design phase for SIMBART I. The government approval procedure was not effective. As a result, the SIMBART team was forced to change the tactical plan at the start of SIMBART II. The government made significant suggestions for changes to the ADEF tactical plan after the Level 3 QAX. These directed changes required the SIMBART team to return to the design phase and make substantial changes to the ADEF mission material developed to that point. The SIMBART team worked almost exclusively on these changes in order to have the training support material ready for the Level 4 QAX. The concentration on implementing these changes detracted from the development of other materials and precluded their refinement before they were used.

A fix to the SIMBART Formative Evaluation/QAX cycle is to modify the last SIMBART Level 1 QAX to include a government review. Thus, the tactical plan approval becomes a prerequisite for starting the development of products tested during the Level 2 QAXs. The COR also needs to examine the review and approval procedures so that the materials are expediently and thoroughly reviewed before approval. The government and the COR then must take steps to ensure that recommendations received after the tactical plan has been approved are adequately weighed in terms of their impact on the project's development progress.

Summary

The SIMBART team produced brigade staff exercises that can be used by any O/C team to provide highly effective training to a mounted brigade staff. The materials in the TSPs can provide the O/C team with all the information it needs to train itself to conduct exercises and provide the brigade staff feedback on its performance during the exercise. The performance of the O/C team will determine the quality of training.

The SIMBART team tested the exercises on the simulation many times during its Level 1 and 2 QAXs. The exercises were designed so there would be a very high likelihood for the brigade to successfully accomplish its mission while maintaining the challenge of the exercise. The brigade staff must receive and analyze the information provided by members of the O/C control team and use this analysis to make recommendations to the commander for each brigade decision point. Failure to analyze the information and make timely recommendations coupled with a failure to execute actions at a decision point can create situations where the brigade may be more challenged to successfully accomplish its mission.

The O/C team executes the orders and manipulates the units (friendly and enemy) using the simulation. The relative ability of the controllers (friendly versus enemy) made a difference in at least one trial. Poor performance or execution by friendly controllers can result in friendly units losing more combat power or inflicting less loss of combat power on the enemy than expected. Even in the instances where controllers made major errors, the results did not affect the quality of the brigade staff training. The exercises were designed for controllers with a reasonable degree of competence on Janus. The TSPs included reminders, specific instructions and suggestions for each controller based upon the many exercises conducted by the SIMBART team. In the QAXs, the exercise design was achieved when controllers with a reasonable level of skill on Janus used the TSP for his/her workstation. The SIMBART team found that the exercise design could be achieved even when controllers lacked the suggested skills or experience when the controllers went through the suggested training/rehearsal program. In other words, the skill of the controllers should not be a major determinant of the quality of the training received by the brigade staff.

One critical function of the O/C team in these exercises is providing the training unit with battlefield information. The quality of the O/C team interactor's reports containing battlefield information and the interactions with the brigade staff did have a major effect on the brigade staff's training. The O/C team must report to the brigade staff what the controllers and interactors see on the simulation's computer screens. The quality and timeliness of reports by the O/C team varied across the QAXs. This variance in quality and

timeliness of reports affected the performance of the brigade staff. The brigade staff is dependent on the information provided by the interactors to perform their staff tasks. The interactors' experience and abilities were the major determinants in the quality of their performance. Interactors with battalion staff officer experience performed their duties at an acceptable level. The SIMBART team recognized that problems were encountered when interactors failed to report needed information to the brigade staff or omitted important portions of the information. The brigade staff had to request the information that was omitted by the interactors. In the instances where the TF failed to report, the brigade staff was required to request information from the TF staff.

The other critical function performed by the O/C team is providing feedback to the brigade staff. The feedback and the AAR process are vital to the success of the training program. The full benefit of the brigade staff training was not achieved during the Level 3 and 4 QAXs because of the AAR process that was used and the feedback that was provided. During the Level 3 and 4 QAXs, staff-level AARs were seriously curtailed from the design. Staff-level AARs designed for 45-60 minutes were shortened to 30 minutes or less during the QAXs. Additionally, the section BOS AARs designed for approximately 30-45 minutes were totally eliminated with the exception of an abbreviated FS AAR. This reduction or elimination of several levels of the AAR process did not provide the staffs the opportunity to discuss their performance and work through how to improve, modify, or sustain that performance. Additionally, the brigade staff AAR concentrated on tactics and command decisions as opposed to the staff's performance. The unit's staff could have achieved a greater benefit from the training if all AAR levels were conducted and the focus of the brigade AAR was on the staff's performance. The importance of the AAR in the training process must not be overlooked. Brown (1992) wrote "The critical event of the BCST (Battle Command Staff Training) is to create a very effective AAR which will cause the intensified battle command staff training to occur" (p. 1-7). Brown (1992) called the AAR the "major training event" (p. 2.1-3). Further, Brown (1992) stated that "the AAR is the dominant training support provided to the unit chain of command" (p. 2.1-3). Brown (1992) also called the AAR "the most effective and efficient portion of the training process" (p. 2-4). The SIMBART brigade staff training exercises were designed so that the AAR process would attempt to fulfill the important role that Brown discussed. The AAR process was scheduled to take approximately three hours to complete.

Concluding Remarks

After reading this chapter, a reader may conclude that implementation of the SIMBART program was not completely successful. This was not at all the case. In fact, the feedback received indicated that the resulting training program is extremely effective. Evolving programs usually encounter problems between inception and conclusion. The current effort was no exception. The authors have tried to be very candid about what they saw as some of these troublesome areas. The difficulties included in these areas, on the whole, were overcome through close coordination among participants. The authors focused their comments and criticisms in this chapter on how the training design and development process, training program and its implementation, and interactions between the contract team and government representatives could have been improved. The intent was to highlight the areas that are thought to be potential problem areas for similar programs as well as present

areas where the team has identified alternatives to accomplishing the program's major objectives which may be preferable to some of the methods instituted under the current effort.

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Appendix A. Acronyms and Abbreviations

AAR	After Action Review
ADEF	Area Defense
AOAC	Armor Officer Advance Course
ARI	U.S. Army Research Institute for the Behavioral and Social Sciences
ARNG	Army National Guard
ARPA	Advanced Research Projects Agency
ARTEP	Army Training and Evaluation Program
AT	Annual Training
AWE	Advanced Warfighting Experiment
A&L	Administration and Logistics
BBS	Brigade/Battalion Battle Simulation
BCST	Battle Command Staff Training
BDA	Battlefield Damage Assessment
BOS	Battlefield Operating System
CAC	Combined Arms Center
CAS	Close Air Support
CB	Citizen Band
C/I	Controller/Interactor
COBRAS	Combined Arms Operations at Brigade Level, Realistically Achieved through Simulation
CONWOR	Controller Workstation
COR	Contracting Officer's Representative
CP	Command Post
CS	Combat Support
C/ST	Commander/Staff Trainer
CSS	Combat Service Support
CTC	Combat Training Center
DAK	Deliberate Attack
DDMP	Deliberate Decision Making Process
DS	Direct Support
DST	Decision Support Template
FM	Field Manual
FM	Frequency Modulated
FS	Fire Support
FSO	Fire Support Officer
FISTV	Fire Support Team Vehicle
FXXITP	Force XXI Training Program
GFE	Government Furnished Equipment
GICOP	Good Idea Cut-Off Point
GS	General Support
HACC	Higher and Adjacent Control Cell
MTC	Movement to Contact
MTP	Mission Training Plan
NCOIC	NonCommissioned Officer-in-Charge
NTC	National Training Center

O/C	Observer/Controller
OE	Organizational Effectiveness
OPFOR	Opposing Forces
OPORD	Operation Order
O&I	Operations and Intelligence
QAX	Quality Assurance Exercise
RCVTP	Reserve Component Virtual Training Program
SGM	Sergeant Major
SIMBART	Simulation-Based Mounted Brigade Training
SIMITAR	Simulation in Training for Advanced Readiness
SIMNET	Simulation Networking
SIMUTA	Simulation-Based Multiechelon Training Program for Armor Units
SIMUTA-B	Simulation-Based Multiechelon Training Program for Armor Units- Battalion Expansion
SIMUTA-D	Simulation-Based Multiechelon Training Program for Armor Units- Digital
SME	Subject Matter Expert
SOW	Statement of Work
TAC	Tactical
TF	Task Force
THP	Take Home Package
TRADOC	Training and Doctrine Command
TSP	Training Support Package
VTP	Virtual Training Program
XO	Executive Officer

Appendix B. Initial Design Report

Movement to Contact

Janus Scenario Outline

55th ID (M)'s Mission. 55th ID (M) moves in zone _____ (H-HOUR, D-DAY) to seize key defensible terrain along PHASE LINE (PL) RUTH from NK631421 to PK365475 and establishes a security zone to PL AARON; on order, defends along PL RUTH to destroy enemy in sector and to retain the UPPER AMARGOSA RIVER VALLEY-CHICAGO VALLEY-PAHRUMP VALLEY (the PAHRUMP VALLEY is off the map to the northeast) approaches into the U. S. Joint Task Force (JTF) lodgement area.

43d SAB's Mission. The 43d SAB moves in zone _____ (H-HOUR, D-DAY) to seize OBJECTIVE (OBJ) EL PASO (NK685475 - NK830465); on order, establishes a security zone to PL AARON; on order, defends in sector along PL RUTH to retain the UPPER AMARGOSA RIVER VALLEY-CHICAGO VALLEY-VALJEAN VALLEY avenues of approach into the JTF lodgement area.

43d SAB Commander's Intent. My intent is to move rapidly to seize key terrain at OBJs EVANS and SALLY (OBJ EL PASO) before enemy forces cross the International Border. Should the Krasnovians cross the border before we are in defensive positions along PL RUTH, we will destroy any enemy forces up to battalion size that we encounter enroute. Upon seizing the key terrain, we will establish a security area for the Brigade out to PL AARON of a company-size element in each task force zone. Success is establishing a security force along PL AARON, and being prepared to defend along PL RUTH with two task force-size elements.

Exercise Training Event List. See map on next page.

- Event #1. Movement to Contact
- Event #2. Conduct a Hasty Attack
- Event #3. Establish a Hasty Defense
- Event #4. Tactical Sustainment Operations

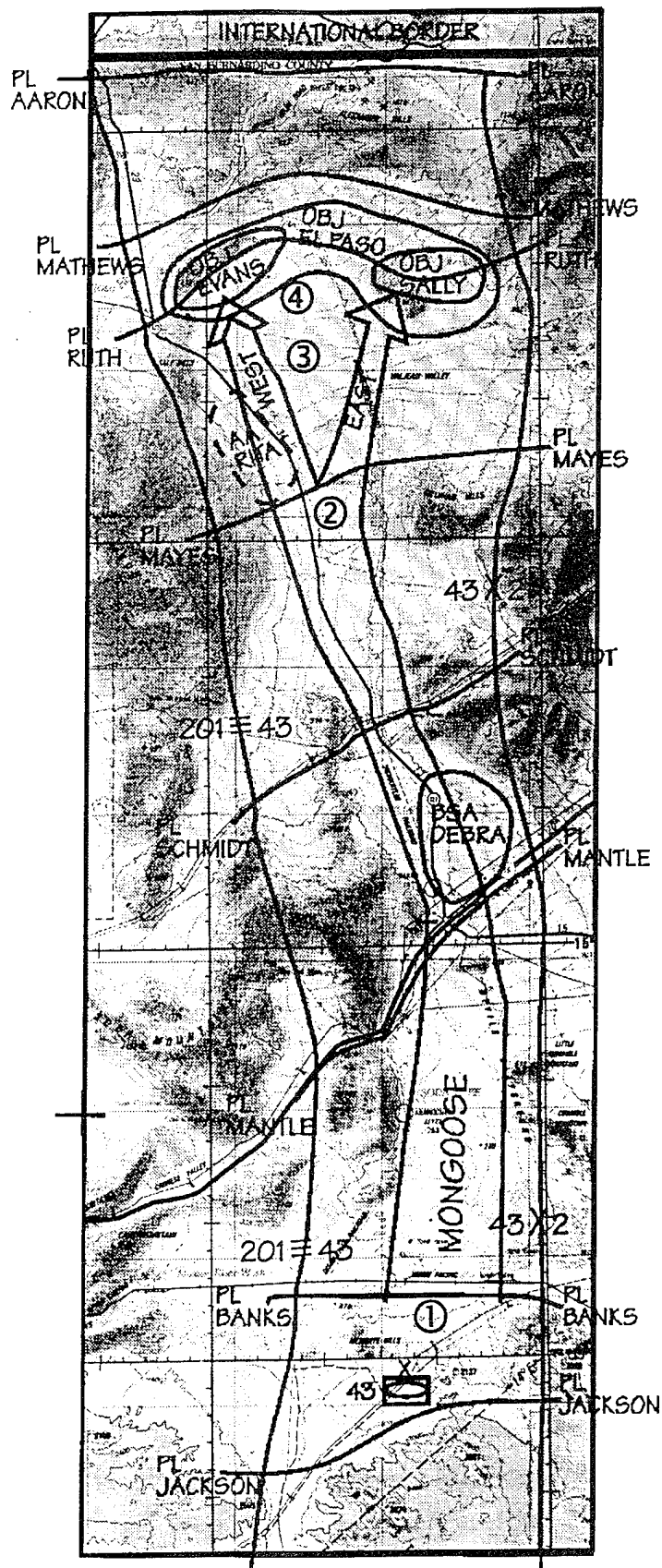


Figure B-1. Brigade Movement to Contact (Janus) - Initial Design Report.

SIMNET Scenario Outline

55th ID (M)'s Mission. The 55th ID (M) moves in zone _____ (D-DAY, H-HOUR) to seize key defensible terrain along PL BAIRD, and establish a security zone to PL ASHBY and defend along PL BAIRD; on order, continue the attack to the southwest.

43d SAB's Mission. The 43d SAB moves in zone _____ (D-DAY, H- HOUR) to seize OBJ LEE (NJ308895) and OBJ GRANT (NJ215940); on order, establishes a security zone to PL ASHBY and defends along PL BAIRD; on order, assists forward passage of a following brigade.

43d SAB Commander's Intent. See map. My intent is to move rapidly to seize key terrain at OBJs LEE and GRANT, and interdict enemy forces encountered moving east toward Interstate 15 (I-15) and the major oil fields to the east in the Shadow and Ivanpah Valleys. After seizing OBJs LEE and GRANT, we will establish a security zone out to PL ASHBY with the Cavalry Troop and a balanced company/team from the Brigade reserve. Success is establishing a security force along PL ASHBY and strong defensive positions along PL BAIRD.

Exercise Training Event List. See map on next page.

- Event #1. Movement to Contact
- Event #2. Conduct a Hasty Attack
- Event #3. Establish a Hasty Defense
- Event #4. Tactical Sustainment Operations

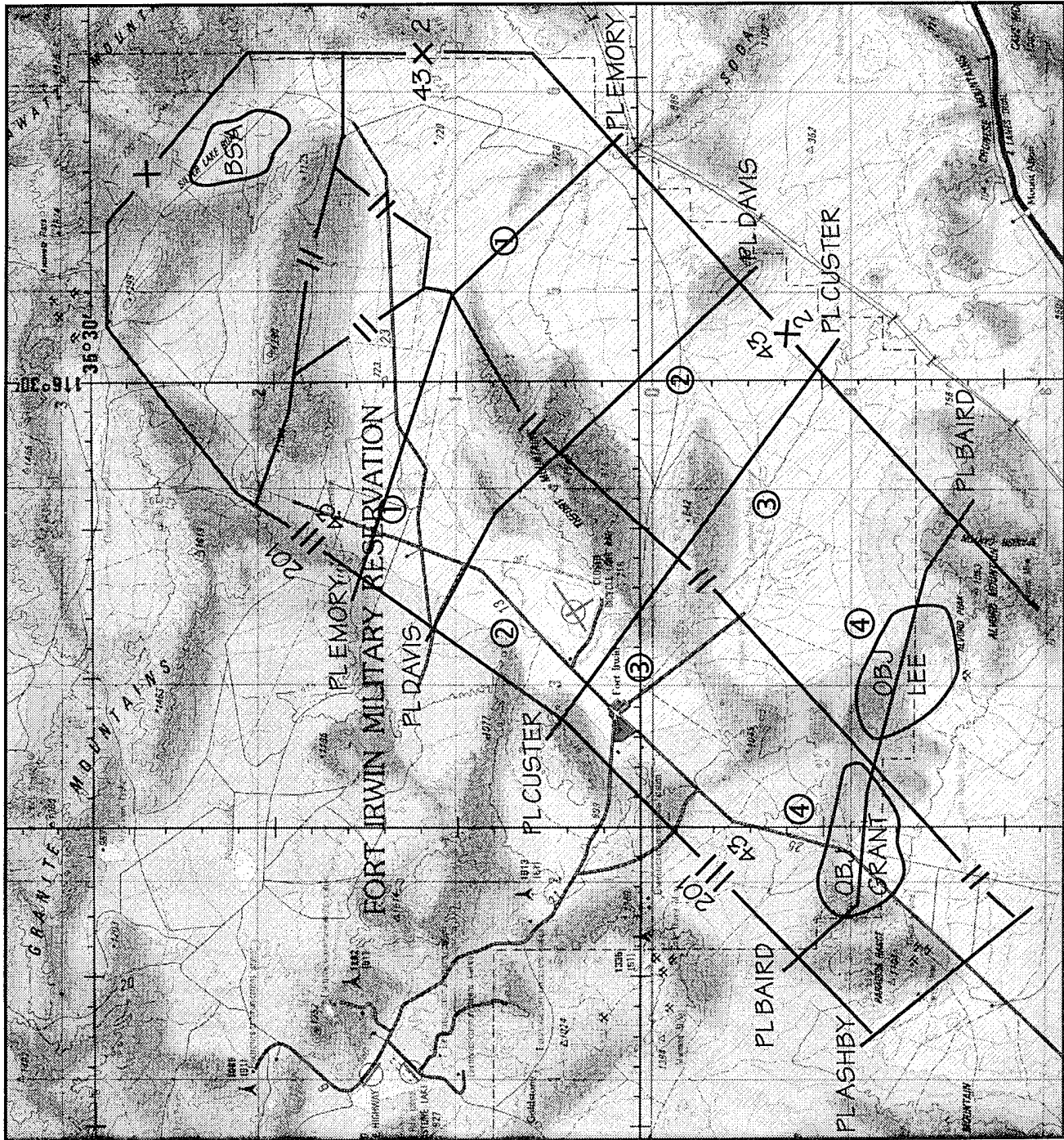


Figure B-2. Brigade Movement to Contact (SIMNET) - Initial Design Report.

Defense in Sector

Janus Scenario Outline

Corps' Mission. The II (US) Corps at H-HOUR, D-DAY, defends in sector from NK3840 to PK0971 to defeat the 15th TA. On order, assist the XII (Allied) Corps in a forward passage of lines to continue the Allied Joint Command's attack.

43d SAB's Mission. The 43d SAB establishes a covering force from NK383403 to NK449597 not later than (NLT) H-HOUR, D-DAY to destroy enemy reconnaissance and attrit the lead battalions of the first echelon regiments; on order, defends in sector from NK476398 to NK520570 to complete destruction of the 231st MRD; on order, counterattacks.

43d SAB Commander's Intent. See map. The intent of this operation is to defeat the 231st MRD in detail. To accomplish this task I intend to use an aggressive security zone operation, continuously engage the lead regiments from PL COWPENS to PL VERDUN, interdict and attrit the 231st MRD's 2d echelon in EA STORM by long-range artillery fires and special munitions, and counterattack to finish destruction of the lead regiments. I plan to employ the Brigade with its internal covering force, two balanced task forces forward, and a tank battalion as the Brigade reserve. This battle will be conducted in five phases. Phase I will be the counter reconnaissance battle and elimination of enemy forward security elements by the Brigade covering force. At the completion of this task, the covering force will conduct a rearward passage of lines through the forward MBA battalion task forces and the Cavalry Troop will assume a flank screen between the Brigade and the 23d AD to the north. The Phase II of the battle will involve the destruction of the lead regimental battalions forward of PL ALAMO. In conjunction with this action, I plan to structure the MBA to force the lead regiments into the natural kill zone at OBJ STYX. Phase III will begin based on the advance of the lead enemy regiments. The northern task force will establish a blocking position between PLs ALAMO and VERDUN while the southern task force fights back to PL VERDUN. Phase IV features the execution of the brigade counterattack along AXIS SWEEP into OBJ STYX. The objective area is formed by a natural depression and the massing of brigade combat power on the lead enemy regiments. Following the successful completion of Phase IV, the brigade counterattack force in conjunction with the southern task force will maneuver to destroy the remnants of the MRD second echelon and reestablish a defense along PL COWPENS. This action constitutes Phase V. The end state for this operation is the Brigade destroying the lead regiments, defeating the surviving enemy formations between PLs ALAMO and COWPENS, and reestablishing a cohesive defense along PL COWPENS. The Brigade then needs to be prepared to assist in the forward passage of the XII (Allied) Corps to the north.

Exercise Training Event List. See map on next page.

- Event #1. Brigade counter-reconnaissance battle.
- Event #2. Rearward passage of lines of covering force.
- Event #3. Engage & attrit the MRD 1st echelon forces
- Event #4. Interdict & attrit MRD 2d echelon forces.
- Event #5. Conduct brigade local counterattack (Destroy 1st echelon forces).
- Event #6. Defeat MRD 2d echelon forces.
- Event #7. Reestablish defensive sector.

SIMNET Scenario Outline

II (US) Corps' Mission. The II (US) Corps attacks H-HOUR, D-DAY to secure OBJ DEVERS (NJ2264) to disrupt the operations of the 19th CAA, secure I-15, and block the HARVARD (NJ3167)-CALICO MOUNTAIN (NJ1765) avenue of approach; on order, continues the attack to seize OBJ HUMPHREYS (NJ0558).

43d SAB's Mission. The 43d SAB defends in sector H-HOUR, D-DAY to retain control of the TIEFORT MOUNTAIN (NK4608)-RED PASS LAKE (NK5804) approach into the Division's rear.

43d SAB Commander's Intent. I intend to defeat any enemy attack into our sector and fix enemy forces to our front, to the maximum extent possible, in order to facilitate the Corps' attack on our left flank. We will do this with a combination of an aggressive forward defense in the western part of the sector and a battle in depth in the eastern part. The Brigade must separate the regiments of the 231st MRD's 1st echelon into mobility corridors, limiting their ability to laterally shift their forces. In the western part of our sector, I want to portray a weak security zone to draw the lead battalions into a kill zone vicinity of BICYCLE LAKE (NK3404). In the east, I intend to destroy the attacking 1st echelon by the combination of a defense in depth and a brigade counterattack by the Brigade reserve. Upon completion of the destruction of the 1st echelon regiment in the eastern part of our sector, the counterattack force will assume a blocking position that will force the MRD's 2d echelon to turn east toward WEST CRONESE LAKE (NJ6090), exposing its flank to the 55th ID (M). The Brigade reserve must also be prepared to execute a counterattack into the western battalion's sector, if required, to assist in the destruction of the lead regiment. Additionally, the Brigade is tasked by Corps to be prepared to attach a tank-heavy task force to 55th ID (M) control. This tasking will be accomplished as an on order mission for the brigade reserve. The end state of this operation is the destruction of the lead regiments in sector, turning of the 231st MRD's 2d echelon's attack to the east, and maintaining a cohesive defense south and west of TIEFORT MOUNTAIN.

Exercise Training Event List. See map on next page.

- Event #1. Detection of enemy forces; start of counter-reconnaissance battle
- Event #2. Battle hand-over to brigade MBA forces
- Event #3. Destruction of enemy main attack
- Event #4. Conduct of brigade counterattack
- Event #5. Block MRD 2d echelon and reestablish defensive sector

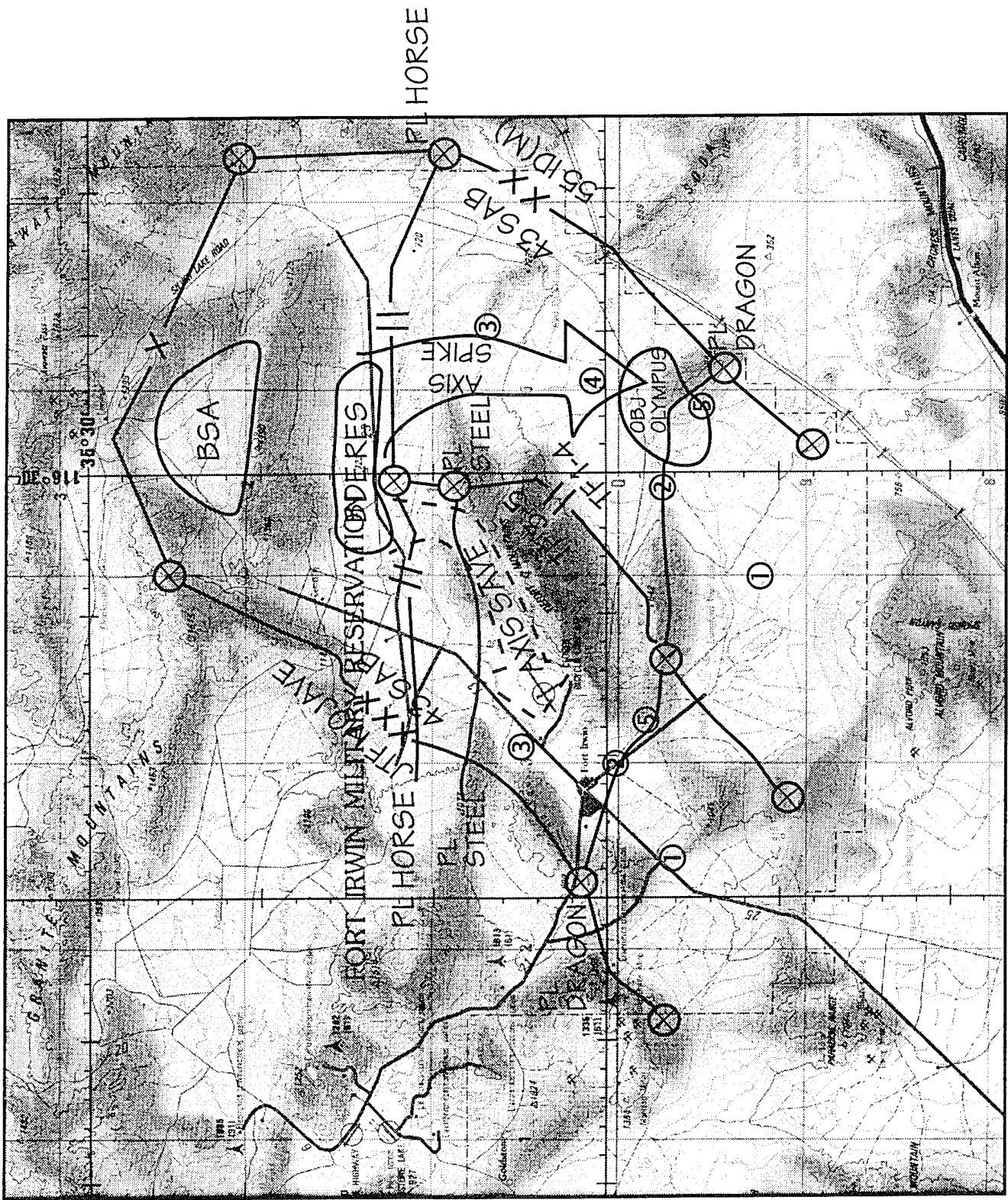


Figure B-4. Brigade Area Defense (SIMNET) - Initial Design Report.

Deliberate Attack

Janus Scenario Outline

Corps' Mission. The II (US) Corps attacks H-HOUR, D-DAY, to penetrate the 19th CAA's main defensive belt at COWHOLE MOUNTAIN (NJ8888), exploit north toward the VALJEAN VALLEY (NK7334-NK9044)-CHICAGO VALLEY (NK6683-NK7597) area (off the map to the north) to interdict the LOCs of the 19th CAA and block reinforcement by Front follow-on echelons.

43d SAB's Mission. The 43d SAB conducts a forward passage of lines through TF CAV and attacks at H-HOUR, D-DAY to seize OBJ LEACH (NJ770829) and OBJ POOLE (NJ806853) to hold open the west (left) shoulder of the Corps penetration; on order, continues attack to seize OBJ POLK (NJ748880).

43d SAB Commander's Intent. I intend to defeat the enemy forces in sector and deny them the ability to disrupt by direct or indirect fires the attack of the 25th AD to our east. I want to maximize the combat power the Brigade brings to bear on the enemy. I will minimize the size of the Brigade reserve and use all battalion command and control (C²) assets to control the maximum number of companies needed for the attack. I intend to accomplish this task in four phases. Phase I will involve the forward passage of lines and the approach of the battalions to their positions or objectives. Phase II involves the isolation of the enemy at the Brigade's main objective by a combination of supporting direct fires and a supporting attack (OBJ POOLE). Phase III consists of the main attack (OBJ LEACH) itself. Phase III will be the penetration of the enemy's defense, facilitating the destruction of enemy forces. Phase IV (OBJ POLK) will only be executed on my command. I will order the assault on OBJ POLK only when I am sure the Brigade controls the key terrain at OBJs POOLE and LEACH, plus the first echelon forces of the enemy have been destroyed or defeated. Following the consolidation of all Brigade objectives, we must push a security force out to PL SUMNER to cut the I-15 east-west LOC. The Brigade's MBA forces must be able to support the security force with direct fires to assist in the defense against a enemy local counterattack along the I-15 corridor, from either the east or west. The end state for this operation is when the Brigade has destroyed the enemy's ability to place fires on the SODA LAKE avenue of approach to the east. We will accomplish this task by destroying all enemy units south of PL BRADLEY or forcing their withdrawal. The Brigade then continues the attack to OBJ POLK and secures all key terrain in sector south of PL SUMNER.

Exercise Training Event List. See sketch on following page.

- Event #1. Conduct forward passage of lines.
- Event #2. Brigade advance.
- Event #3. Isolate enemy on main attack objective.
- Event #4. Main assault.
- Event #5. Continue attack to subsequent objective.
- Event #6. Consolidate sector/establish hasty defense.

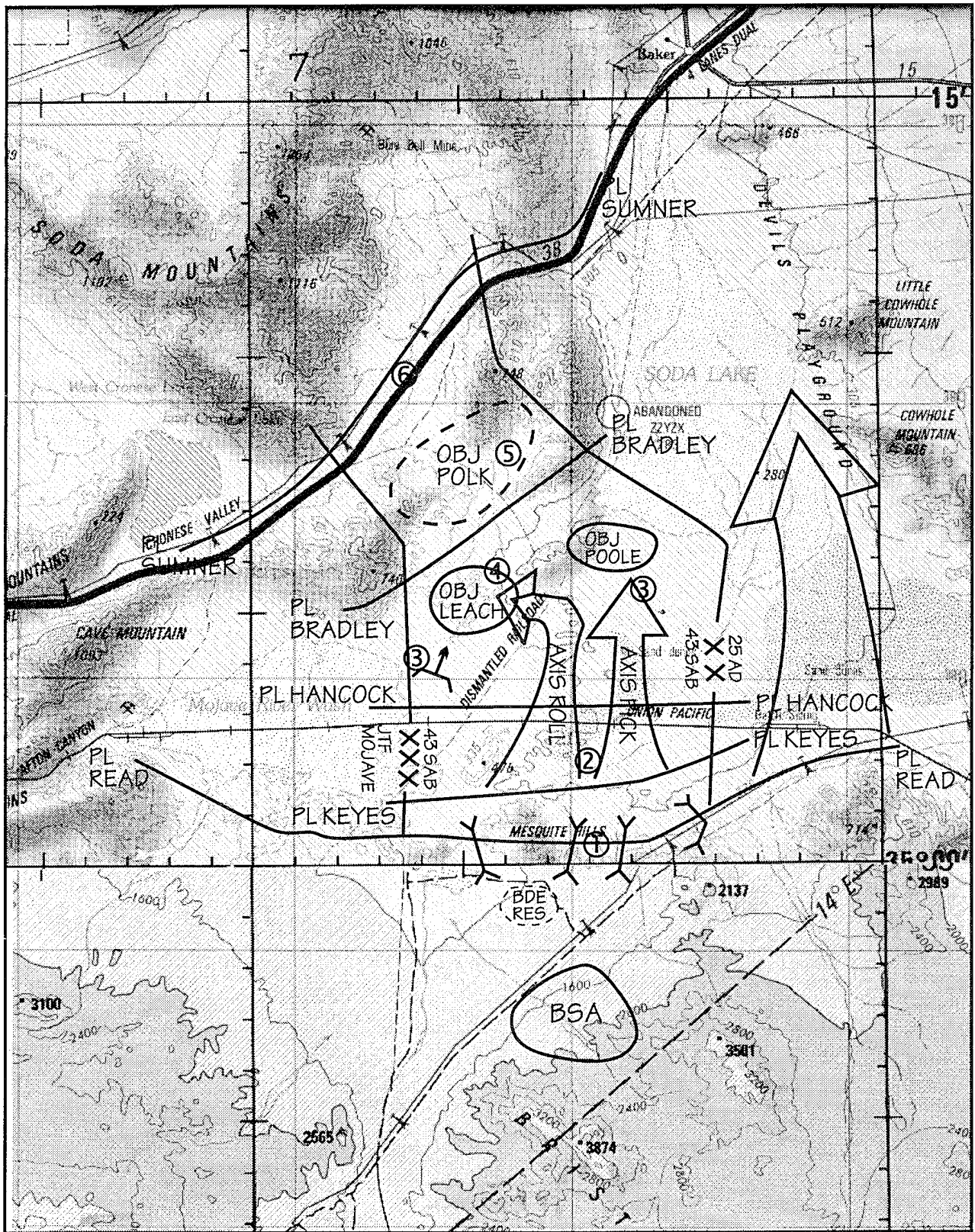


Figure B-5. Brigade Deliberate Attack (Janus) - Initial Design Report.

SIMNET Scenario Outline

JTF's Mission. The JTF Mojave attacks H-HOUR, D-DAY, to penetrate the main defensive belt in zone and destroy enemy forces out to PL RASOR. On order, be prepared to interdict the enemy LOCs along I-15.

43d SAB's Mission. The 43d SAB attacks at H-HOUR, D-DAY to penetrate the enemy defenses at NJ4192 and seize OBJ PARRIS. On order, be prepared to either continue the attack to the east or establish a hasty defense along PL RAINBOW, and assist in the forward passage of follow-on forces to exploit the rupture of the enemy's defensive belt.

43d SAB Commander's Intent. The intent of this operation is to quickly penetrate the enemy's hasty defenses with maximum forces forward, destroy enemy forces in zone, and seize the key terrain at OBJ PARRIS. We will begin the attack in a Brigade vee formation so as to initially provide maximize combat power forward. I want the two lead task forces to simultaneously attack and seize intermediate OBJs HILTON and JAMES, followed by the trail task force, the Brigade's main effort, attacking in the center of the zone to seize OBJ PARRIS. We will employ a balanced mech task force to seize OBJ HILTON and tank-heavy task forces to seize OBJs JAMES and PARRIS. I want the Cavalry Troop on our north to provide flank security for the Brigade as the task forces move east in zone. The end state for this phase of the operation is the seizing of OBJ PARRIS. Be prepared to continue the attack to the east or to assist in the forward passage of the Mojavian Tank Regiment Battle Group in support of the JTF OPLAN.

Exercise Training Event List. See map on next page.

- Event #1. Conduct forward passage of lines
- Event #2. Brigade advance
- Event #3. Attack (achieve rupture)
- Event #4. Establish hasty defense

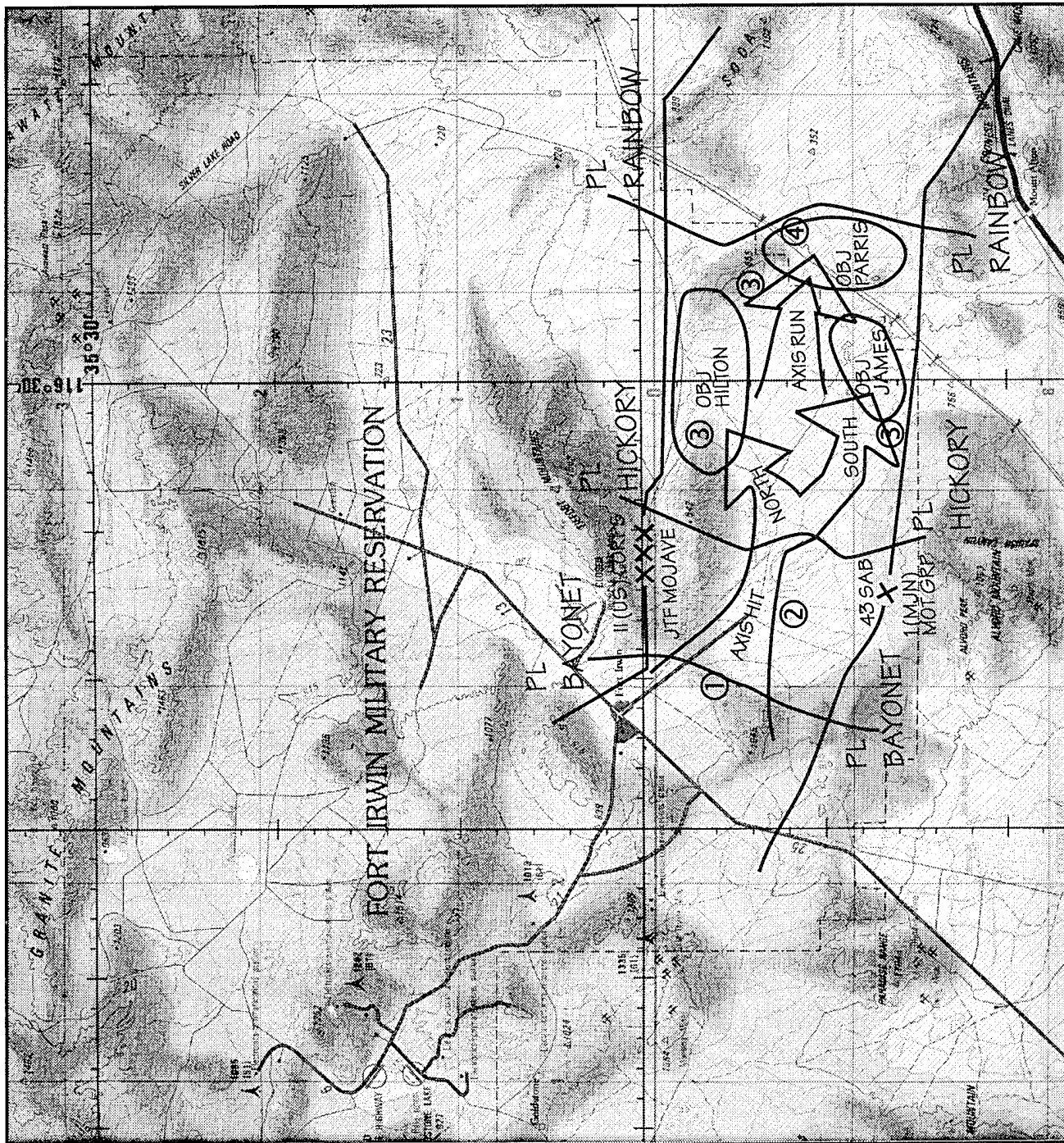


Figure B-6. Brigade Deliberate Attack (SIMNET) - Initial Design Report.

Appendix C. Modified Design Report Exercise Outlines

Movement to Contact

55th ID (Mech)'s Mission. The 55th ID (Mech) conducts a movement to contact in zone D-Day, H-Hour to seize OBJECTIVES (OBJs) GRANT (NK200000) and SHERMAN (MJ880630), and establish a security zone to PHASE LINE (PL) JACKSON. On order, defends along PL QUINCY to defeat enemy in sector and to retain the Superior Valley-Granite Mountain-Langford Well Lake approaches into the US Joint Task Force (USJTF) lodgement area.

Bde 21's Mission. Bde 21 conducts a movement to contact in zone D-Day, H-Hour to secure OBJ CHEVY (NK330155), OBJ SALLY (NJ124830), and OBJ EVANS (NJ150960); on order, establishes a security zone to PL DAVIS; on order, defends in sector along PL QUINCY to retain the Superior Valley-Granite Mountain-Langford Well Lake AAs into the USJTF lodgement area. See map.

Bde Commander's Intent. My intent is to move rapidly to secure defensible terrain at OBJ CHEVY, OBJ SALLY and OBJ EVANS. Upon securing these objectives, we will establish a security zone out to PL DAVIS with a company-size element in each task force zone. Success is establishing a security force along PL DAVIS, and being prepared to defend along PL QUINCY with three task force-size elements.

Exercise Training Event List. See map on the next page.

- Event #1. Movement to Contact
- Event #2. Conduct a Hasty Attack
- Event #3. Establish a Hasty Defense
- Event #4. Tactical Sustainment Operations

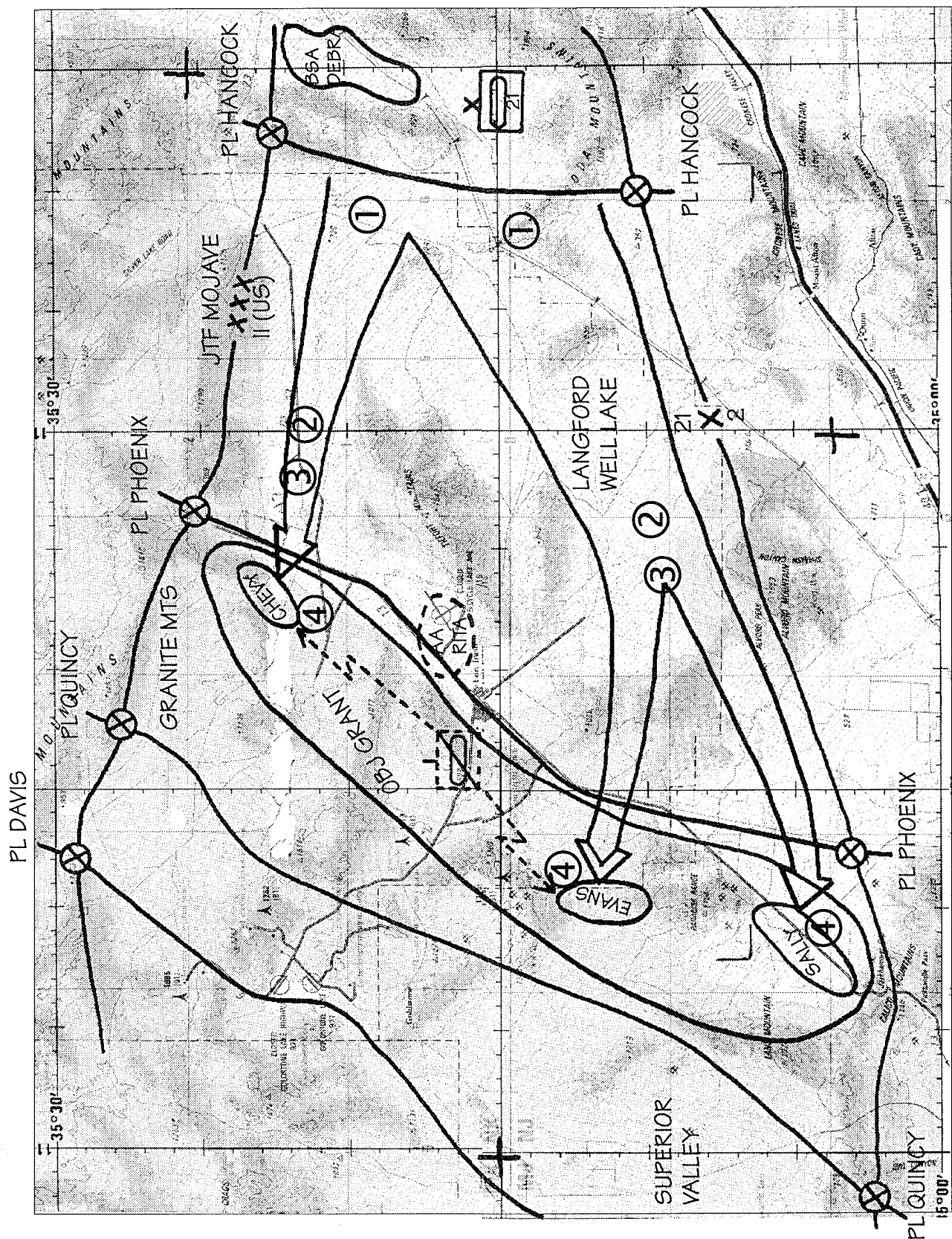


Figure C-1. Brigade Movement to Contact - Modified Design Report.

Area Defense

55th ID (Mech)'s Mission. The 55th ID (Mech) conducts an area defense in sector (NK2324 to MJ7947 to NK5917 to NJ5638) not later than (NLT) D-Day, H-Hour to defeat all attacking Krasnovian forces; on order, counterattack.

Bde 21's Mission. Bde 21 defends in sector from NK2324 to MJ9177 NLT D-Day, H-Hour to prevent penetration of the 55th ID (Mech)'s northern flank along the I-15 AA (NJ4473). See map.

Bde 21 Commander's Intent. I intend to defeat any enemy attack into our sector while retaining control of the mobility corridors which exit into the Coyote Lake, Langford Well Lake and Red Pass Lake areas. I will use a combination of a defense in depth and local counterattack to defeat the enemy, plus render enemy forces in sector incapable of further offensive operations. The end state of this operation is the destruction of the lead regiments in sector, defeat of the divisional tank regiment, and a cohesive defense west of Tiefort Mountain and the Paradise Range.

Exercise Training Event List. See map on next page.

- Event #1. Brigade counter-reconnaissance battle
- Event #2. Rearward passage of lines of covering force
- Event #3. Engage and attrit the MRD 1st echelon forces
- Event #4. Interdict and attrit MRD 2d echelon forces
- Event #5. Conduct brigade local counterattack (Destroy 1st echelon forces)
- Event #6. Defeat MRD 2d echelon forces

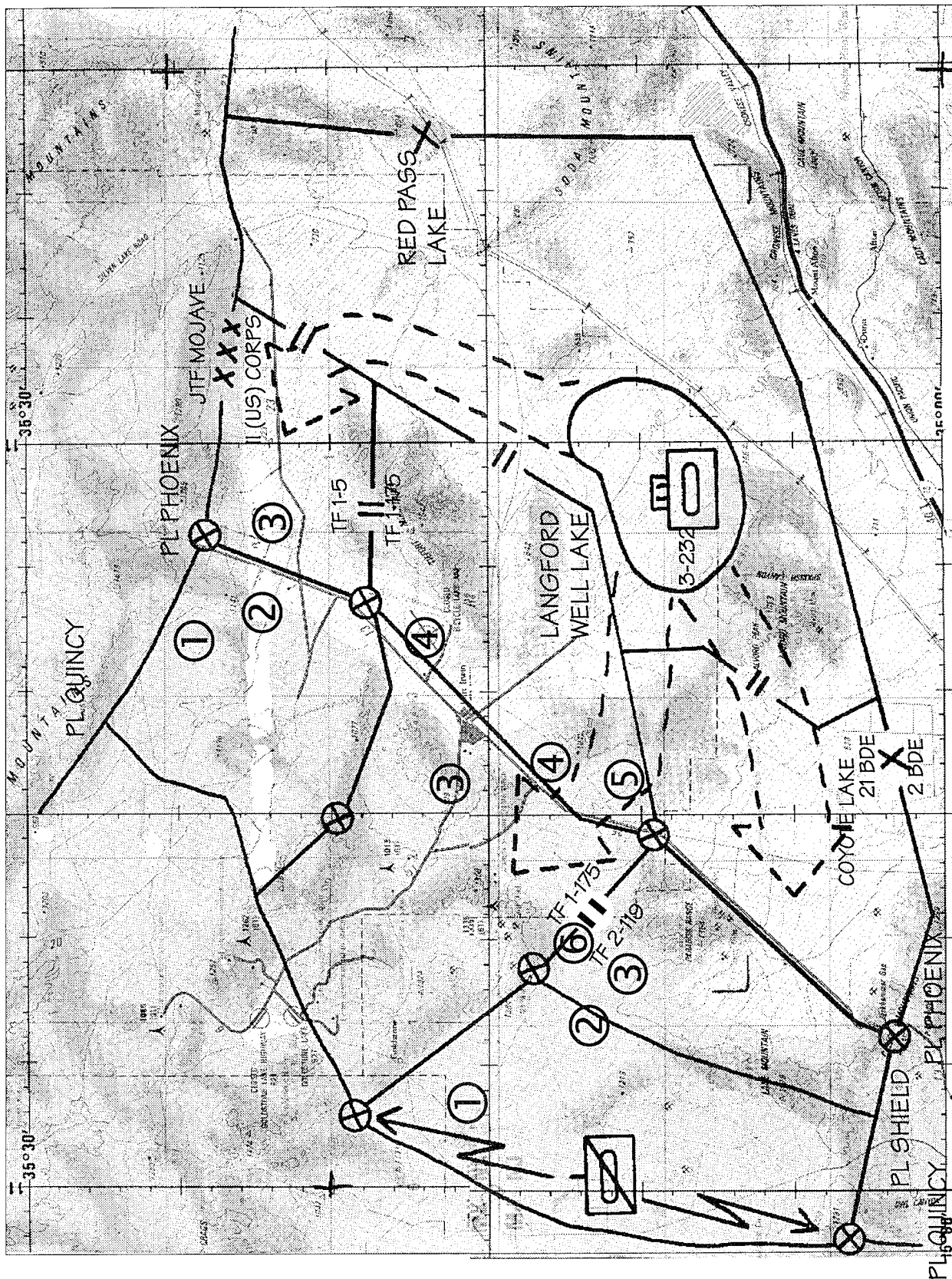


Figure C-2. Brigade Area Defense - Modified Design Report.

Deliberate Attack

55th ID (Mech)'s Mission. The 55th ID (Mech) attacks D-Day, H-Hour to OBJ WACO (MJ7575) and fixes enemy forces in zone to protect the north flank of AXIS PICK. On order, exploits success in zone.

Bde 21's Mission. Bde 21 attacks at D-Day, H-Hour to seize OBJ VIPER (NJ165965) and OBJ COBRA (NK330160). On order, destroy enemy in zone out to PL QUINCY, on order to PL JACKSON. See map.

Bde 21 Commander's Intent. I intend to seize quickly key terrain at OBJs COBRA and VIPER and defeat enemy forces in sector in order to prevent them from threatening the Division main effort to our south. Once this is achieved, I want to sustain momentum and attack out to PL JACKSON. The end state is defeat of enemy forces out to, and establishment of a defense along PL JACKSON.

Exercise Training Event List. See map on next page.

- Event #1. Conduct forward passage of lines
- Event #2. Brigade advance
- Event #3. Isolate enemy on main attack objective
- Event #4. Supporting attack
- Event #5. Main attack
- Event #6. Continue attack in sector
- Event #7. Consolidate/establish hasty defense

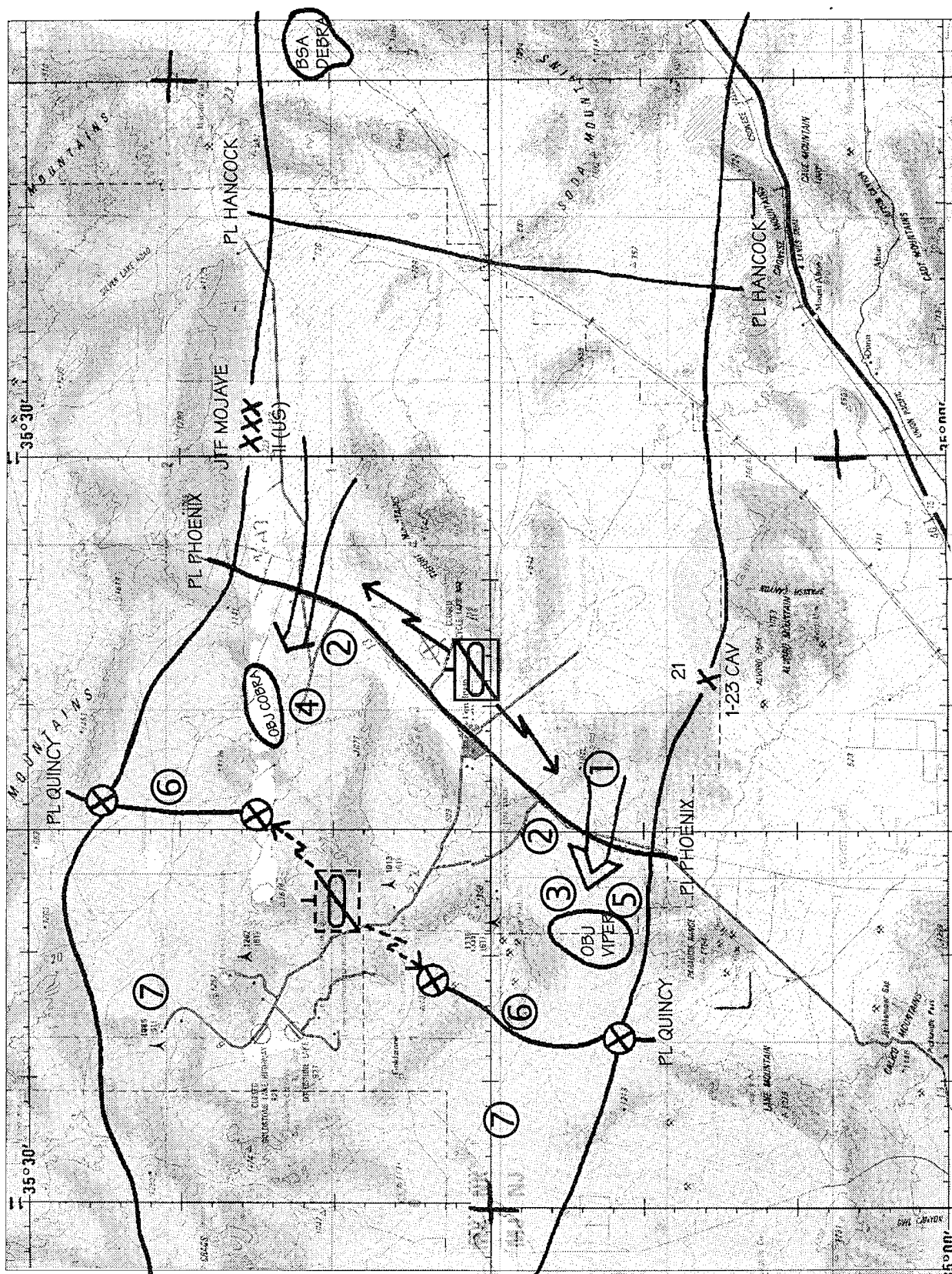


Figure C-3. Brigade Deliberate Attack - Modified Design Report.

Appendix D. Initial Training Support Package

Movement to Contact

55th ID Mission. 55th ID (Mech) conducts movement to contact in zone D-Day, H-Hour to seize OBJs GRANT (NK 200000), and SHERMAN (MJ 880630), and establish a security zone to PL JACKSON. On order, defends along PL QUINCY to defeat enemy in sector and to retain the SUPERIOR VALLEY-Rte 58/I-15/40-GRANITE MOUNTAIN-LANGFORD WELL LAKE approaches into the USJTF lodgement area.

Brigade 21 Mission. Bde 21 conducts movement to conduct in zone D-Day, H-Hour to secure OBJ SALLY (NJ124840), OBJ EVANS (NJ 150960), and OBJ CHEVY (NK 330155); on order, establishes a security zone to PL DAVIS; on order, defends in sector along PL QUINCY to retain the SUPERIOR VALLEY-GRANITE MOUNTAIN-LANGFORD WELL LAKE avenues of approach into the USJTF lodgement area.

Brigade 21 Commander's Intent. My intent is to move rapidly to secure defensible terrain at OBJ SALLY, OBJ EVANS, and OBJ CHEVY. Upon securing these objectives, we will establish a security zone out to PL DAVIS with a company sized element in each task force zone. Success is establishing a security force along PL DAVIS, and being prepared to defend along PL QUINCY with three task force sized elements.

Training Event Sketch. See map on next page.

- Event #1. Movement to Contact
- Event #2. Conduct a Hasty Attack
- Event #3. Establish a Hasty Defense
- Event #4. Tactical Sustainment Operations

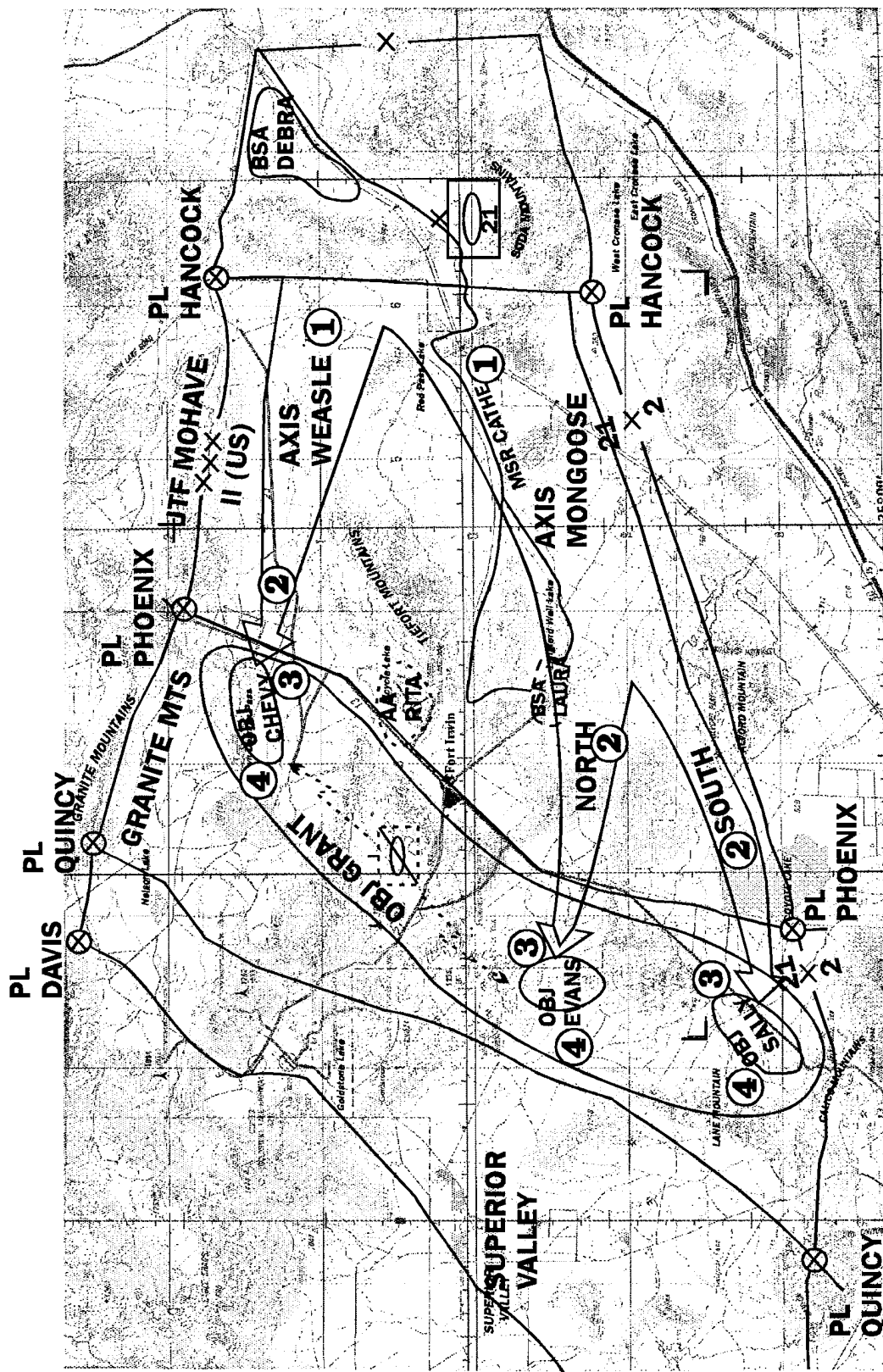


Figure D-1. Brigade Movement to Contact - Initial TSP.

Area Defense

55th ID (Mech)'s Mission. 55th ID (Mech) conducts an area defense in sector (NK 2527 to MJ 6547) from PL QUINCY to PL HANCOCK NLT D-Day, H-Hour to defeat attacking Krasnovian forces in zone; on order, counterattack.

Bde 21's Mission. Bde 21 defends in sector from NK 233256 to MJ 996909 NLT D-Day, H-Hour to defeat attacking Krasnovian forces and prevent penetration of the Division right (north) flank; on order, assist in the forward passage of 3d Brigade. See map.

Bde 21 Commander's Intent. I intend to defeat the Krasnovian attack into our sector by conducting a defense in depth. The brigade is tasked to retain control of PL PHOENIX to hold the division northern flank and protect the division counterattack along AXIS MULLIGAN. I will use a brigade security force along PL DAVIS to win the counter-recon battle, and defend with battalion task forces in sector in the center and north of the brigade MBA where the risk is low while massing brigade combat power against the enemy main effort in the south. This defense is designed to segregate the 1st echelon attack into non-supporting mobility corridors while separating the enemy's lead echelon from supporting assets. This situation will allow the Brigade to counterattack and defeat the enemy's attack. The end state for this operation is the destruction of all enemy formations east of PL QUINCY, the FEBA re-established along the west side of PL PHOENIX, and the Brigade prepared to assist in the forward passage of 3d Brigade.

Training Event Sketch. See map on next page.

Event #1. Withdraw of the Brigade security force

Event #2. Displace to PL PHOENIX

Event #3. Conduct Brigade counterattack / Re-establish BP 11

Deliberate Attack

55th ID (Mech)'s Mission. 55th ID (Mech) attacks D-Day, H-Hour to penetrate enemy defenses vicinity OBJ MOHICAN (NJ 1595). On order, assist forward passage of 25th AD and 201st ACR.

Bde 21's Mission. Bde 21 attacks D-Day, H-Hour to seize OBJ COBRA (NK 3316), OBJ IVEY (NK 2906), and OBJ KAIN (NK 1721) and secure key terrain to prevent the enemy from counterattacking into the 55th ID (Mech) penetration to our south. See map.

Bde 21 Commander's Intent. I intend to initially focus the enemy's attention with strong supporting attacks weighted with tanks and artillery. The main attack will be conducted by two balanced TFs to seize terrain to the west of Nelson Lake. The end state is defeat of the enemy out to PL DAVIS and the securing of enemy avenues of approach from the north into the Division penetration.

Training Event Sketch. See map on next page.

- Event #1. Supporting attacks
- Event #2. Advancement of main attack
- Event #3 . Intermediate objective of main attack
- Event #4. Main attack
- Event #5. Consolidate/establish hasty defense

Figure D-3. Brigade Deliberate Attack - Initial TSP.

Appendix E. Final Training Support Package

Movement to Contact

55th ID Mission. The 55th ID (Mech) conducts movement to contact in zone 150500 Mar 9x to seize OBJs GRANT (NK 200000), and SHERMAN (MJ 880630), and establish a security zone to PL JACKSON. On order, defends along PL QUINCY to defeat enemy in sector and to retain the SUPERIOR VALLEY-Route 58/I-15/40-GRANITE MOUNTAIN-LANGFORD WELL LAKE approaches into the USJTF lodgement area.

Brigade 21 Mission. Bde 21 conducts movement to contact in zone 150500 Mar 9x to secure OBJ SALLY (NJ124830), OBJ EVANS (NJ 150960), and OBJ CHEVY (NK 330155); on order, establishes a security zone to PL DAVIS; on order, defends along PL QUINCY to retain the SUPERIOR VALLEY-GRANITE MOUNTAIN-LANGFORD WELL LAKE avenues of approach into the USJTF lodgement area.

Brigade 21 Commander's Intent. My intent is to move rapidly to secure defensible terrain at OBJ SALLY, OBJ EVANS, and OBJ CHEVY. Upon securing these objectives, we will establish a security zone out to PL DAVIS with a company sized element in each task force zone. Success is establishing a security force along PL DAVIS, and being prepared to defend along PL QUINCY with three task force sized elements.

Exercise Training Event List. See map on next page.

- Event #1. Movement to Contact
- Event #2. Fight a Meeting Engagement
- Event #3. Establish a Hasty Attack or Hasty Defense
- Event #4. Tactical Sustainment Operations

Movement To Contact

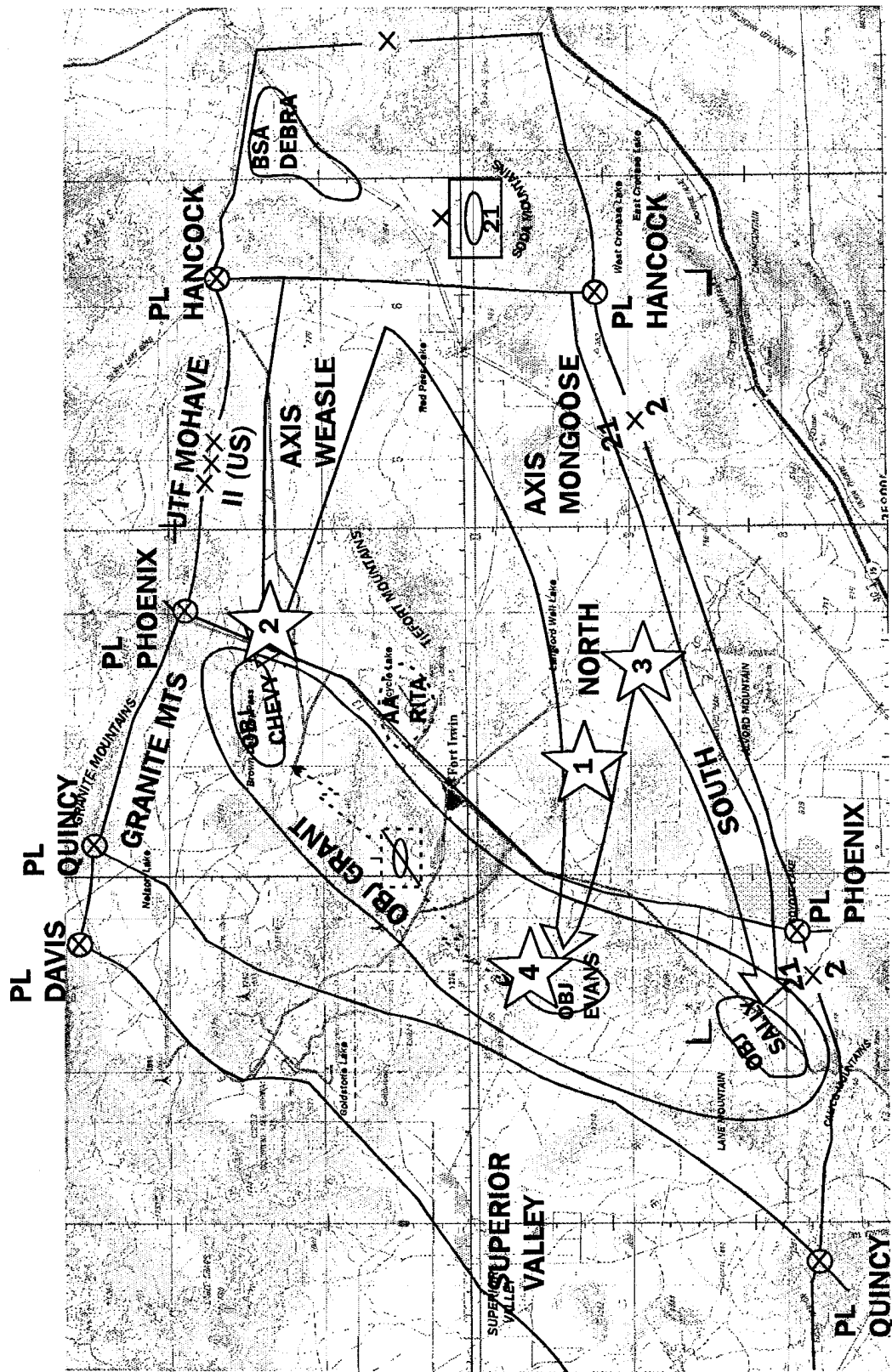


Figure E-1. Brigade Movement to Contact - Final TSP.

Area Defense

55th ID (Mech) Mission. 55th ID (Mech) conducts an area defense (NK 2527 to MJ 6547) from PL QUINCY to PL HANCOCK NLT 170500 March 9X to defeat attacking Krasnovian forces in zone; on order, counterattack.

Bde 21's Mission. Bde 21 defends from NK 233256 to MJ 996909 NLT 170500 March 9X to defeat attacking Krasnovian forces and prevent penetration of the Division right (north) flank.

Bde 21 Commander's Intent. This Brigade will retain control of the dominant terrain along PL PHOENIX to secure the Division northern flank and guard Division counterattack avenue AXIS MULLIGAN. I intend to accomplish this mission by conducting an area defense to defeat the Krasnovian attack into our sector. I will use a Brigade security force along PL DAVIS to win the counter-recon battle. In the center and north of the Brigade MBA, I am prepared to accept risk to be able to mass the combat power of up to three task forces against the enemy main effort in the south. The end state for this operation is the destruction of all enemy first echelon formations; defeat of second echelon formations between PL QUINCY and PL PHOENIX; and, the retention of defendable terrain along PL PHOENIX to insure that the western flank of AXIS MULLIGAN is secured.

Exercise Training Event List. See map on next page.

- Event #1. Withdraw the Brigade security force
- Event #2. Destroy MRD 1st Echelon in EA BELMONT
- Event #3. Displace to PL PHOENIX
- Event #4. Conduct Brigade counterattack / Defeat enemy attack
- Event #5. Consolidate / Re-occupy BP 11 / Reorganize

The map is a tactical representation of a region in the southwestern United States, specifically around the area of Quincy, Davis, Phoenix, and Hancock. It features a grid system for location tracking. Key elements include:

- Geographical Features:** Grand Mountains, Superior Valley, and various lakes (e.g., Lake Superior, Lake Superior, Lake Superior) are labeled.
- Units and Positions:**
 - Phoenix:** Marked with a star and labeled "PHOENIX".
 - Quincy:** Marked with a star and labeled "QUINCY".
 - Davis:** Marked with a star and labeled "DAVIS".
 - Hancock:** Marked with a star and labeled "HANCOCK".
 - Belmont:** Marked with a star and labeled "BELMONT".
 - Pointset:** Marked with a star and labeled "POINTSET".
 - Other Units:** BP 11, BP 23, BP 31, BP 33, TF FALCON, TF EAGLE, AA CIRCLE, and others are marked with various symbols.
- Infrastructure:** Roads, rivers, and other geographical features are shown with lines and labels.
- Scale:** A scale bar at the bottom indicates distances in miles (0, 10, 20, 30).

E - 4

Deliberate Attack

55th ID (Mech) Mission. 55th ID (M) attacks 210300 Mar x to penetrate 231 MRD to seize OBJ DAYTON (MJ 1798). On order, assist forward passage of 25th AD and 201st ACR on AXIS JAB.

Bde 21's Mission. Bde 21 attacks 210500 March 199x to seize OBJ KIOWA (NK 2520) and secure key terrain to prevent the enemy from counterattacking into the 55th ID (Mech) penetration to our south.

Bde 21 Commander's Intent. I intend to initially focus the enemy's attention with a strong supporting attack in the south to deceive the enemy as to the focus of our main effort. The main effort will initially secure passage lanes through passes vicinity NK 3015. The main attack will seize terrain to the west of Nelson Lake (NK 1721). The end state is defeat of the enemy out to PL DAVIS and the blocking of enemy avenues of approach from the north into the Division penetration.

Exercise Training Event List. See map on next page.

- Event #1. Supporting attacks
- Event #2. Advance of main attack
- Event #3. Intermediate objective of main attack
- Event #4. Main attack
- Event #5. Consolidate/establish hasty defense

Appendix F. Exercise Training Event Matrix

EXERCISE TRAINING EVENT MATRIX (Area Defense) Decision Point #2: Execute Counterattack into EA BELMONT

CRITICAL EVENT	OPFOR CUES	SUBUNIT CUES	BLUEFOR ACTIONS	BDE C2 ACTIONS
Transition from Bde security area to Bde MBA	<ul style="list-style-type: none"> • 269 & 166 MRRs continue attack. • 218 MRR conducts a supporting attack in north. • DAG displaces on main attack axis. 	<ul style="list-style-type: none"> • BLUE-1s from TF SeaHawk • TF Outlaw reports PL POINSETT • BLUE-1s from TF Falcon • B-14 Cav reports PL QUINCY • TF Eagle reports AA CIRCLE 	<ul style="list-style-type: none"> • TF Outlaw delays to PL POINSETT • TF SeaHawk in contact w/ enemy units from SBF 175 • B-14 Cav delays to PL QUINCY • TF Falcon fights at PL QUINCY 	<p>Cmd Gp: Move to SBF 119 TAC CP: Alert Main need to displace Main CP: Prep for close battle C2 Rear CP: sustain & track ops; assist Main CP as requested</p>
Coordination to mass combat power into EA BELMONT	<ul style="list-style-type: none"> • 269 & 166 elements hit Obst Belt Q-1 / cross CP 32 • 218 MRR attacks from the March 	<ul style="list-style-type: none"> • TF SeaHawk reports en 1st ech • TF Outlaw reports en at CP 32 • TF Eagle reports REDCON 1 • TF Falcon reports contact w/ FSE • B-14 Cav reports Goldstone clear en at CP 32 • COLT Tms report en at Q-1 	<ul style="list-style-type: none"> • TF Outlaw fights delay to prevent en re-forming CRPs • TF SeaHawk assist TF Outlaw • Bde orders TF Eagle to SBF 119 • Bde coor pre-planned CAS • FSCCOORD posns FA to spt EA BELMONT fight 	<p>Cmd Gp: Concur w/ FRAGO TAC CP: displace Main CP: issue FRAGO to TF Eagle / coor air & fire spt Rear CP: sustain & track ops; assist Main CP as requested</p>
TF Outlaw closes into BP 11	<ul style="list-style-type: none"> • 269 MRR continues attack east • 166 MRR turns to SSE into suspected MBA. • Div combined arms reserve moves forward. 	<ul style="list-style-type: none"> • TF SeaHawk starts MBA battle fwd of SBF 175; submits BLUE 1s • TF Eagle reports move • TF Outlaw reports BP 11; closes Q-4; updates TF BLUE 2 • TAC CP reports moving posn 	<ul style="list-style-type: none"> • TF SeaHawk gets priority of fires • COLT Tms start CopperHead • Bde verifies Q-4 closed • Bde coor ACAs required • Bde orients MBA forces to enemy attack axis (Intel update) 	<p>Cmd Gp: SBF 119 TAC CP: Re-establish ops Main CP: transition w/ TAC CP; updates Bde BLUE 2 to HACC Rear CP: sustain & track ops</p>
Enemy 1st echelon slows or stalls in EA BELMONT (Obst Belts Q-2, Q-3, Q-4) forward of PL POINSETT (TRP AG 0043)	<ul style="list-style-type: none"> • 269 MRR slows attk to posn RAG / start breaching ops • 166 slows to start breaching ops • 218 MRR slows attack to posn RAG 	<ul style="list-style-type: none"> • TF SeaHawk engages en • TF Eagle closes at SBF 119 • TF Outlaw reports no contact • TF Falcon destroys FSE • B-14 Cav reports En Bn+; NAI 41 	<ul style="list-style-type: none"> • FSCCOORD max fires on A4L & A5L; fire A2L to disrupt DAG/ RAGs • Shift main effort to TF Eagle • Bde verifies posns of TFs oriented on EA BELMONT • Bde verifies Q-5 Engr Tm in place 	<p>Cmd Gp: no chg TAC CP: Track reports, analyze, Main CP: Bttl-trk, update HACC Rear CP: sustain & track ops</p>
Spoiling attack by TF Eagle from SBF 119 oriented on EA BELMONT	<ul style="list-style-type: none"> • 269 MRR reacts to CATK • 166 MRR starts attk south • 231st AT BN moves to save DAG • DAG reacts to CATK 	<ul style="list-style-type: none"> • TF SeaHawk fixes en at Q-2/3 • TF Eagle at SBF 119 / engaging • TF Outlaw stops en adv at Q-4 • TF Falcon sector stable • B-14 Cav reports sector clear 	<ul style="list-style-type: none"> • Fires from TF SeaHawk & TF Outlaw combine on enemy lead Ech • TF Eagle engages en from flank • CAS engages en in EA BELMONT • COLT Tms maximize CopperHead • Locate possible En flank security units exiting Superior Valley [NAI 41] 	<p>Cmd Gp: no chg TAC CP: Track reports, analyze, Main CP: Bttl-trk, update HACC, request info on 33 TR Rear CP: sustain & track ops</p>

Figure F-1. Exercise training event matrix.